THE IRON TRADE REVIEW

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ACTIVE DEMAND

FOR FINISHED MATERIAL IN NEARLY ALL CENTERS.

Some Irregularity in Pig Iron, Especially in the South.—Probability of Strike Affects Coke Market —Bar Iron Weak.

Although in some centers there is a dimunition in orders for finished materials, this condition is exceptional, and nearly everywhere business is brisk and mills are unable to keep up with specifications. In pig iron the market is somewhat irregular, especially in the south. The increased probability of the strike of coal miners is causing heavy buying of coke.

Southern Pig Iron Lower. The improved demand for southern iron has brought out lower quotations and $13.75 Birmingham for No. 2 is now openly named, while 25 cents lower has been done. There is, however, much in favor of the buyer, as stocks are low, consumption continues at a heavy rate, the car supply is irregular, and the strike is not to be ignored. In the north, prices of foundry iron are firm, although there is some weakness in southern Ohio. The United States Steel Corporation has purchased 5,000 tons of basic from the Bessemer Pig Iron Association at $17 at the furnace for March and April delivery and some important inquiries for basic are pending. An independent interest has purchased 5,000 tons of Bessemer pig iron for prompt shipment at $17.50, valley, and the Bessemer market is in good condition, there being very little iron available for early shipment. Gray forge is strong. Ferro-manganese for spot shipment has been sold at $135 and at $112 for April delivery, but it is not so easy as formerly to place orders at $85 for the second half of the year.

Crude Steel Scarcity. The scarcity of billets and sheet bars continues, and the condition will be even worse when the Ohio works of the Carnegie Steel Co. go off sheet bars to make rails for the remainder of the year.

Extensive Building. The American Bridge Co. closed orders for about 10,000 tons of material during the week, among the contracts being one for 3,200 tons for a Chicago office building. Active preparations are being made for extensive building operations in all parts of the country, but in the Chicago district the demand for plates and sheets is not as strong as it was a few weeks ago.

Bar Iron Irregular. Large consumers came into the market a few days ago in Chicago and placed orders aggregating from 4,000 to 6,000 tons for bar iron at $32 to $33 per ton, but the market in that city has since advanced. The demand for bar iron is irregular and little is being sold at more than $34. Only a fair business in steel bars is being done.

Sheet Orders Pressing. The demand for sheets is more pressing. On account of the scarcity of bars, some mills have been compelled to stop operations. The demand for wire is exceedingly strong and jobbers find difficulty in supplying the demand. Among the contracts for cast iron pipe are 2,500 tons for Cleveland and the same amount for Duluth. The contract for 10,000 tons for New Orleans will soon be awarded. Specifications for merchant steel are very heavy and mills have not caught up on their orders.

Coke is Being Stored. The demand for coke is active, and evidence is not lacking that consumers are storing large quantities in anticipation of the coal miners' strike. There is, however, little change in prices.

Some Furnaces Banked. During the cold weather of the past few days considerable ice has been made in upper lake ports and the prospect now is that navigation will not be opened as soon as had been expected. All arrangements are being made, however, for a record breaking season in the carrying of ore. Considerable ore has been sold recently to help out furnaces which have not covered for their full requirements up to the opening of navigation. Virginia furnaces have had difficulty in keeping in operation on account of inadequate supply of ore. Owing to the present rather high price of Lake Superior ores, and the freight rate, Virginia stacks have been depending to a large extent on local ores. Some of them are now banked.

RAIL SALES OF THE WEEK.

(Special Telegram.)

New York, March 14.—Rail sales of the week are announced as follows: Las Vegas & Tonopah, 5,000; Pere Marquette, 10,000; Ft. Dodge & Des Moines Southern, 6,000; Green Bay, Oshkosh & Madison Southern, 6,000; M. K. & T. 9,000 additional, usual sales to trolley roads, large tonnage for big roads are pending.

Dynamite Outrage in Cleveland.—Eighty non-union structural iron workers, employed by the American Bridge Co. on the Taylor Arcade, Cleveland, which for several months has been the scene of a strike declared by the International Association of Bridge and Structural Iron Workers, were asleep in the Frankfort Hotel of that city March 12 when a heavy charge of dynamite was fired on the roof. As the explosive was not confined, its force was spent without loss of life or any damage more severe than the wrecking of the roof and a few upper rooms. The charge was evidently placed by an amateur; had it been exploded where its full force would have been exerted, it would have wrecked the building and many deaths would have been certain. A heavy detail of detectives has been guarding the building and hereafter the hotel will be closely watched. The attack was similar in method to the dynamiting outrages in New York which resulted in the death of two workmen who had taken the places of striking members of the structural iron workers' union.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Strong Demand for Finished Material. —Pig Iron is Quiet.

OFFICE OF *The Iron Trade Review*,
521 PARK BUILDING, March 14.

The activity in finished lines continues unabated and is really the feature of this market during the week under review. While this has been the case for some time past, it is brought into prominence by the comparative quiet in other lines. The situation in other lines is not weak by any means, however, the fact being that everybody is waiting for the buying movement in pig iron which is expected to show itself before the first of the second quarter. Semi-finished steel is very strong and the supply is only about 80 per cent of the requirements. The limited supply is in few hands and is being held at high prices. Bar iron and scrap are still weak.

New business is being felt in the finished lines to a greater extent than for some time past, the mills having been kept running to capacity to make deliveries on specifications against old contracts. The demand for sheets is something enormous and the most urgent means are being used to secure shipments. This is true also of wire products and makers have practically discontinued quotations on semi-finished material on account of the demand of their own finishing departments.

In pig iron the only sale of any importance was closed by the Bessemer pig iron association Tuesday when the United States Steel Corporation bought 5,000 tons of basic pig iron at $17, valley furnaces for March and April delivery. The matter of further second quarter Bessemer purchases has not yet been taken up, but it is expected that negotiations will open before the end of the month.

The coal strike situation has taken on a more serious aspect during the past week and those who so confidently predicted there would be no trouble between the operators and miners in the soft coal regions are not as positive as they were. All the large manufacturing interests are stocking coal as fast as they can get it and a car shortage in other lines has developed to a considerable extent on this account. The railroads are also holding coal in cars to be prepared for an emergency and this has withdrawn to a great extent the usual supply of cars.

Pig Iron.—The United States Steel Corporation on Tuesday bought from the Bessemer Pig Iron Association 5,000 tons of basic pig iron at $17 valley for March and April delivery and within the past ten days 5,000 tons of Bessemer pig iron has been sold for prompt shipment at $17.50, valley. This does not include the recent corporation purchase nor is it a part of that transaction. The mystery surrounding the reported sale of basic pig iron at $16.75 has been fathomed and results show that it can in no way be considered as fixing the market. This pig iron went to Johnstown: it was sold at $18 delivered and the freight on the valley basis would have been $1.25. Within the next 30 or 60 days a deal involving a very considerable tonnage of basic will be put through. The Chicago situation regarding malleable Bessemer and foundry iron is reported in this district as being very strained and consumers are urging shipment. Under existing conditions it is a very hard matter to anticipate shipments and consumers are lucky to get what is coming to them. Gray forge is strong at $16.25 to $16.40, valley. No. 2 southern is quoted at $13.75, Birmingham and gray forge, southern, at $12.50. Southern furnaces are pretty well sold up and are experiencing a scarcity of cars in which to make shipments.

Bessemer, Valley	$17.50 to 17.75
Bessemer, Pittsburg	18.35 to 18.60
No. 1 Foundry, Pittsburg	18.50 to 19.00
No. 2 Foundry, Pittsburg	18.10 to 18.35
Gray Forge, Pittsburg	17.10 to 17.25
Basic, Valley	17.00 to 17.25
Basic, Pittsburg	17.85 to 18.10

Ferro-Manganese.—The alloys have been more active than usual during the week under review and 80 per cent ferro-manganese for spot shipment has been sold at $135 while for April delivery $112 has been done. The $85 quotations for delivery before second half are not as numerous as they have been. There has been a considerable inquiry for ferro-silicon, 50 per cent, and $110 has been asked.

Billets.—The scarcity of billets and sheet bars is as noticeable as heretofore reported and after the next week this situation will be even worse when the Ohio Works of the Carnegie company will go off sheet bars and go onto rails for the remainder of the year. Bessemer billets are quoted $27.75, Pittsburg, and open-hearth $28.75. Small billets are quoted $33 to $34.

Skelp.—The situation has not changed, mills are running full on old contracts and prices remain unchanged as follows:

Bessemer grooved, 1.65c to 1.70c; sheared, 1.70c to 1.75c; basic, grooved, 1.65c to 1.70c; sheared, 1.70c to 1.75c; iron skelp, grooved, 1.65c to 1.70c; sheared, 1.80c.

Muck Bar.—With the decline in bar iron muck bar is quoted lower and the market is now nominally about $29, Pittsburg.

Rails and Track Material.—The past week has been comparatively light as far as new orders are concerned and the business booked has not been greatly to exceed 10,000 tons, and of this two orders of 2,500 tons each were placed by western electric lines. The demand for light rails continues good. We quote:

Fifty pounds and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 16 pounds, $30; 20 pounds, $28.50 to $29; 25 to 45 pounds, $28; angle bars for standard sections, 1.75c; spikes, $2.05 to $2.00.

Merchant Pipe.—There has been no change in this market, current new business is fair and all that is lacking to make pipe makers happy is a revival of business in the oil country. Reports concerning this are contradictory, some predicting a revival and others taking a pessimistic view of this branch of the business. During the past year the National Tube Co., at its 10 mills made a grand total of 75,000 miles of tubular goods, including all sizes and classifications from ⅛ inch to 30 inch. Prices remain the same, there being not much prospect of an advance on account of sharp competition and no chance at all of a reduction as the card is now as low as it can go in order to allow pipe to be made at any profit. We quote pipe, consumers' carloads as follows, with jobbers' carloads one point higher discount:

	Steel		Iron	
Consumer's Carloads	Black	Galv.	Black	Galv.
⅛ and ¼ inch	71	55	67½	51½
⅜ inch	73	59	69½	55½
½ inch	75	63	71½	59½
⅝ to 6 inches	79	69	76	66
7 to 12 inches	74	59	71	55½
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	64	52	60½	48½
½ to 4 inches	71	59	67½	55½
4½ to 8 inches	67	55	63½	51½
Double extra strong plain ends, ½ to 8 inches	60	49	56½	45½

Boiler Tubes.—New business is good and the demand for deliveries on old contracts is heavy. Locomotive boiler tubes are in particularly heavy demand. On merchant boiler tubes, 22 feet and under, consumers' carloads, we quote as follows:

	Steel	Iron
1 to 1½ inches	46	41
1¾ to 2¼ inches	58	41
2½ inches	60	46
2¾ to 5 inches	66	53
6 to 13 inches	58	41

Less than carload lots two points less.
2½ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Structural Material.—Reports on the

building movement from all parts of the country are extremely good and anybody who has anything in the nature of structural shapes has no difficulty in selling them. Some of the mills are booked so heavily and so far ahead that they are not in position to accept further business. Mills are not catching up materially on delivery and in the east, particularly New York, buyers are in such straits for material that they eagerly snatch up most anything that will help them out. During the week under review no contracts for any buildings out of the ordinary have been closed as far as can be learned. The opening of bids for the construction of the tunnel under Detroit river at Detroit was not carried out March 8, as was originally intended but was delayed until March 20. It is still doubtful whether structural steel will be used in this undertaking or whether it will be a cast iron proposition. Prices remain unchanged and we continue to quote as follows:

Beams and channels, 15 in., and under, 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.75c; angles from 3 to 6 inches, inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.60c base.

Plates.—While this market is not particularly weak, and nobody is oversold, the conditions surrounding delivery are not much better than heretofore with the leading interest, although eastern mills are making fair delivery. We continue to quote as follows:

Tank plate ¼ inch thick, 6¼ to 100 inches, 1.60c f. o. b. mill, Pittsburg. Extras are as follows per 100 pounds, boiler and flange steel plates, .10c; A. B. M. A. and ordinary firebox steel plates, .20c; still bottom steel, .30c; marine steel, .40c; locomotive firebox steel, .50c; all sketches excepting straight taper plates, varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, .10c; complete circles, .20c. Plates in width over 100 inches up to 110 inches, .05c; over 110 inches up to 115 inches, .10c; over 115 inches up to 120 inches, .15c; over 120 inches up to 125 inches, .25c; over 125 inches, up to 130 inches, .50c; over 130 inches, 1.00c. Gauges under ¼ inch to and including 3-16 inch plates on thin edges, .10c; under 3-16 inch to and including No. 8, .15c; under No. 8 to and including No. 9, .25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—The demands of jobbers and consumers are growing more pressing and within the past week consumers have not been content to write or telegraph, urging immediate shipment on contracts, but have come to Pittsburg to personally press their claims. New business and specifications against old contracts are considerably more from a tonnage standpoint than shipments. There has been a decided scarcity of sheet bars; the leading interest has been receiving only about 80 per cent of its requirements and this alone accounts for the fact that all mills are not being operated to capacity. Independent interests depending upon others for their supply of semi-finished materials are in the same position. The Ohio Works of the Carnegie Steel Co., will be taken off sheet bars at the end of the week and after that time the conditions governing supply of semi-finished materials will be in even worse shape than at present. We continue to quote:

Black steel sheets, box annealed, cold rolled, one pass: Nos. 11-12, 2c; Nos. 13-14, 2.05c; Nos. 15-16, 2.10c; Nos. 17-21, 2.15c; Nos. 22-24, 2.20c; Nos. 25-26, 2.25c; No. 27, 2.30c; No. 28, 2.40c. Galvanized, Nos. 10-11, 2.35c; Nos. 12-14, 2.45c; Nos. 15-16, 2.55c; Nos. 17-21, 2.70c; Nos. 22-24, 2.85c; Nos. 25-26, 3.05c; No. 27, 3.25c; No. 28, 3.45c. Corrugated roofings, 1.70c per square for No. 28 painted, 2½-inch corrugation; 3.05c per square for No. 28 galvanized, 2½-inch corrugation. Quotations f. o. b. Pittsburg on large lots.

Tin Plate.—Conditions have not changed and the demand for delivery is as great as ever on old contracts. New business is fair and during the last week was heavier than for several weeks previous.

We quote: $3.50 per base box, f. o. b. Pittsburg, 14 x 20 100-pound cokes, terms 30 days, less two per cent off for cash in 10 days. Some mills allow a 5c per box rebate on this price to the large trade.

Merchant Bars.—Common iron bars are still very weak and the prevailing quotations are 1.75c Pittsburg, or 1.70c Youngstown. There has been some business done at this figure and indications point rather to a decline more than a stiffening in price. Refined iron bars are quoted 2c to 2.05c. We quote:

Common iron bars, 1.75c to 1.80c in carload lots, 1.85c in less than carloads; Bessemer steel bars, 1.50c; open-hearth steel bars, 1.50c; plow and cultivator, 1.50c net; channels, angles, zees and tees, under 3 inches, 1.60c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds .10c advance, less than 1,000 pounds, of a size, .30c advance.

Wire and Wire Nails.—Reports from the trade are to the effect that jobbers' stocks are very low and the mills, in order to meet specifications have been unable to maintain their customary stocks, but are taking products direct from the machines to cars for shipment. Within the past ten days new business to the extent of a considerable tonnage has been taken although mills are operating to capacity to fill specifications on old business. There has been no change in prices and we continue to quote:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90, and less than carload lots, $2; painted barb wire, $2 for jobbers in carloads; retailers in carloads, $2.05, and less than carloads, $2.15, with 30c for galvanizing; plain wire $1.70 to jobbers and $1.75 by carload.

Merchant Steel.—New business is very encouraging and specifications against contracts have been heavy. The business is still in excess of shipments. We continue to quote:

Cold rolled and ground shafting, 50 per cent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.70c to 1.80c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.05c to 2.10c. The price of planished and machine straightened tire is 1.70c base half extras as below. Iron finished tire up to 1½ inch by ½ inch 1.65c base half extra tire list. Iron finished tire 1½ inch by ½ inch and over to be sold on regular bar basis of 1.50c base, half extra steel card.

Hoops and Bands.—It is probable that the cotton tie market will be opened for the season within the next two weeks. The date has not been determined, neither has the price been fixed. On hoops and bands we quote:

Hoops, 1.90c in carload lots, and 2c on less than carload lots; bands, 1.50c base, half extras as per standard steel card. Prices f. o. b. Pittsburg.

Old Material.—Scrap has taken another downward step during the past week and there is practically nothing doing, dealers not being anxious to sell at the prevailing low prices and consumers holding off for a still further decline. The fact that two of the very large interests have been selling very freely has also had its effect in crowding down the market and dealers have been placed in a position where for the time being at least they must stand idly by and hope for better things. We quote: gross tons, heavy melting stock, $14.75 to $15; old steel rails, long lengths (rerollers) $15.75 to $16.00; No. 1 cast scrap, $14.75 to $15.00; cast borings, $8 to $8.50; bundled sheet scrap, $13.75 to $14; No. 1 railroad wrought, $17 to $17.50; No. 1 yard faggotting scrap, $16.50 to $17; low phosphorus scrap, $18.75 to $10.00; wrought turn-

ings, $11.75 to $12.00; busheling scrap, $13.50 to $14; iron axles, $24 to $25.

Coke.—There has been a heavy demand for foundry grades during the past week and foundries are evidently stocking in anticipation of a strike in the bituminous regions. This movement has had the effect of maintaining prices and foundry coke is quoted $2.90 to $3.10 and furnace $2.35 to $2.50. Should the miners and operators succeed in coming to an agreement and the possibilities of a strike be averted a very decided slump in the coke market is expected. The estimated production of the Connellsville region for the week ending March 3 was 381,992 tons, of which 282,729 tons was produced by the Connellsville region proper and 99,263 by the lower Connellsville region.

CHICAGO.

Dullness in Pig Iron Has Extended to Finished Materials.

Office of *The Iron Trade Review*, 1164 Monadnock Block, March 13

The indifference that foundrymen have shown towards the pig iron market for some weeks has spread to some lines of finished material. The dullness is most noticeable in structural shapes because of the enormous rush that has been felt for months past to get shipments of this material. Plate mills are also experiencing an apathetic demand, but feeling it more keenly, and efforts are being made to book orders by promising immediate deliveries. Inquiry for sheets has fallen off, and to stimulate trade independent mills are offering to meet the rebate of $1 a ton made by the leading producer. The market has also lost strength from the activity of consumers in disposing of their surplus stocks purchased when prices were from $4 to $6 a ton lower than at present. Bar iron was active last week, and several thousand tons changed hands at prices ranging from 1.60c to 1.65c Chicago. Prices have since advanced and quotations are now firm at 1.71½c base, half extras. Steel bars are quiet, implement manufacturers declining to consider their next season's requirements on the basis of present prices. As the date of the opening of lake navigation approaches, heavy specifications for pipe, tubes and wire products are being received from consumers in the northwest for lake shipment. Wire mills are crowded with specifications and are thousands of tons behind in their shipments. Contracting for cast iron pipe continues of good volume, the week's business including an order from Duluth for 2,500 tons and one from Kansas City for 900 tons. The new Orleans letting for 10,000 tons will not come up before May 15. Scrap continues weak and without life.

Pig Iron.—This is a drifting market with only an occasional ripple caused by an inquiry running into the thousands of tons. These, however, rarely develop into business and invariably are withdrawn after prices have been quoted. Melters are skeptical of the outcome of the present dullness, and confine their purchases to small lots for quick shipment. The market has grown steadily weaker, and southern quotations rest on the basis of $14 Birmingham for No. 2 foundry and northern prices at $19.25 Chicago for No. 2. Furnaces with comfortably filled order books or makers of well advertised brands are getting from 25 cents to 50 cents a ton higher in transactions involving small tonnages. The reports from the east that southern furnaces have offered iron in that territory as low as $13.75 Birmingham find no verification here, and are generally considered to have reference to other than standard grades. However, a large local radiator concern which is asking bids on 1,200 tons of high phosphorus iron and 1,000 tons of medium phosphorus iron is declining all offers based on $14 Birmingham for No. 2, announcing that it expects to buy at $13.75 or better. From a statistical standpoint, the position of furnaces for the maintenance of the higher schedule could not possibly be better. Stocks are low, consumption unabated, car supply irregular, and, more potent than all, there is the possibility of a coal strike. Yet despite these elements of strength, every week has seen accessions to the furnaces willing to accept the lower prices. Local furnaces still hold their quotations from $19.25 to $19.50 Chicago for No. 2 foundry, but have little iron to offer for early delivery. Sales of valley malleable have been made in this market this week at a price equivalent to $19.25 Chicago. Our quotations are as follows:

Lake Superior charcoal	$20.00 to 20.50
Northern Foundry No. 1	19.50 to 20.00
Northern Foundry No. 2	19.00 to 19.50
Northern Foundry No. 3	18.50 to 19.00
Northern Scotch Foundry	19.50 to 20.00
Ohio Strong Softeners No. 1	20.30
Ohio Strong Softeners No. 2	19.80
Southern Foundry No. 1	18.40 to 18.90
Southern Foundry No. 2	17.90 to 18.40
Southern Foundry No. 3	17.40 to 17.90
Southern Foundry No. 4	17.15 to 17.65
Southern No. 1 Soft	18.40 to 18.90
Southern No. 2 Soft	17.90 to 18.40
Southern Gray Forge	16.40 to 16.90
Southern Mottled	16.15 to 16.65
Southern Silveries (4 percent to 6 percent Silicon)	18.40 to 18.90
Jackson Co. Silveries, 8 to 10 percent Silicon	23.30 to 24.30
Alabama and Georgia Car Wheel	22.65
Malleable Bessemer	19.25 to 19.50
Basic Iron	18.65

Coke.—While the volume of trading is no heavier, the market has a stronger tone due to the graver phase of the coal situation. Should a strike occur, and one is now considered almost certain, local dealers expect a sharp advance in prices of coke will immediately follow. Demand is brisker that it has been for some weeks, especially for spot shipment, though it is all for small lots. Connellsville 72-hour brands are firm at $3 at the ovens, which is an advance of 15 cents a ton, making the local price $5.65 Chicago; furnace coke is quoted at $2.25 to $2.35 ovens. By-product coke is firm at $5.65 to $5.80 Chicago.

Billets and Rods.—Demand for rods and billets continues good. Local mills are not soliciting actively for business, having scarcely enough tonnage left to take care of their regular customers. Forging billets are quoted $35 Chicago, and Bessemer rods $36 Chicago.

Iron and Steel Bars.—The large consumers of bar iron who have been waiting for the market to reach a basis where it would be attractive for them to buy, covered last week for an aggregate of 4,000 to 6,000 tons at prices ranging between 1.60c and 1.65c. These inquiries have been pending for some time, and with their removal prices have strengthened and the tone of the market is better. The leading makers have since marked up their prices, one of the companies quoting 1.71½c rates, half extras, which is on the basis of $1 a ton above steel bars. There is little activity in steel. Implement manufacturers are protesting against the present price as being too high for the basis of next season's requirements, and show no disposition to consider contracts of this nature. Concessions, however, are not yet thought of and prices remain firm.

We quote carload lots, Chicago delivery, as follows: Soft steel bars and bands, 1.66½c half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 2.06½c base, full extras; old rail stock, 1.70c to 1.80c. There is a good movement from local warehouses and jobbers' prices are firm. We quote bar iron, 2.25c full extras; soft steel rounds and squares, 3 inches and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1⅛ nich and thicker, $2 per 100 pounds base; flats, 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half ovals and half rounds, $2 per 100 pounds base; steel bands, $1.95 to $2.00 half extras; soft steel hoops, $2.30 to $2.40 full extras. Other sizes not mentioned above, $1.85 per 100 pounds base, plus half extras.

Sheets.—Some weakness has developed in black and galvanized sheets, and independent mills are again meeting the rebate of $1 a ton made by the leading producer. Consumers are also demoralizing the market by offering their surplus tonnage at reduced prices. A variation of $4 to $6 a ton exists in the prices at which these sellers bought and those now prevailing, which net them a good profit, after shading

the present market for $1 to $2 a ton. Specifications for black sheets are light. Official prices are without change,

Nos. 8, 9 and 10, 1.86½c; Nos. 11 and 12, 1.91½c; Nos. 13 and 14, 1.96½c; Nos. 15 and 16, 2.06½c. Box annealed, Nos. 18-20, 2.26½c to 2.31½c; Nos. 22-24, 2.36½c; No. 26, 2.41½c; No. 27, 2.46½c; No. 28, 2.56½c; No. 29, 2.71½c; No. 30, 2.81½c. Jobbers' prices are as follows: No. 10, 2.15c to 2.25c; No. 12, 2.20c to 2.30c; No. 14, 2.25c to 2.35c; No. 16, 2.35c to 2.45c; Nos. 18 and 20, 2.50c to 2.55c; Nos. 22 and 24, 2.55c to 2.60c; No. 26, 2.60c to 2.65c; No. 27, 2.65c to 2.70c; No. 28, 2.70c to 2.75c; No. 30, 3.15c to 3.20c.

Quotations on galvanized shipments, carload lots, mill shipments, are as follows: Nos. 10-11, 2.51½c; Nos. 17-21, 2.86½c; Nos. 22-24, 3.01½c; Nos. 25-26, 3.21½c; No. 27, 3.41½c; No. 28, 3.61½c; No. 29, 3.86½c; No. 30, 4.11½c. From store, galvanized sheets are quoted as follows: Nos. 10 and 20, 3c to 3.10c; Nos. 22 and 24, 3.15c to 3.25c; No. 26, 3.35c to 3.45c; No. 27, 3.55c to 3.65c; No. 28, 3.75c to 3.85c; No. 30, 4.95c to 5c.

Merchant Steel.—Buyers are sounding mills on their season's requirements, commencing with next July. It is considered early to take up this class of business, and except in pressing instances, action has been postponed. Specifications continue very heavy and manufacturers have not yet caught up with the delinquent tonnage on their books. Prices are without change, and we quote mill shipments, Chicago deliveries, as follows:

Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c to 2.40c; smooth finished machinery steel, 1.91½c; smooth finished tire, 1.86½c base; plow steel, 2.20c and upward, according to quality; toe calk steel, 2.21c; railway spring, 1.86½c. Cold rolled shafting, 50 per cent off in carload lots and 45 per cent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and up.

Plates.—Demand for plates is of an apathetic nature, specifications and new tonnage from this territory being below the average. The local mill is in position to give early deliveries on sheared material, while eastern manufacturers of universal plates are promising deliveries within one week. Prices remain unchanged, mill shipments, Chicago delivery, being quoted as follows:

Tank steel, ¼ inch and heavier, up to 100 inches wide, 1.76½c base; flange steel 1.86½c base; marine steel, 1.96½c base; all full extras. Plates 3-16 inch thick, $2 extra; guages, 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Store prices are very firm. We quote from local stocks: tank steel, ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; 72 inches to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 3-16 inch 72 inches wide, 2.35c to 2.45c; No. 8, up to 60 inches wide, 2.15c to 2.25c; flange steel, 25c extra; heads, 25c extra.

Structural Material.—There is a noticeable falling off in current business. Specifications also are light, a change which is attributed to the crowded condition of mills. After the active winter that has been experienced, the present lull does not come as a surprise. All the mills have large tonnages on their books, many with "live" specifications in hand sufficient to take up their output for the next six months. Prices are without change, and we quote mill shipments, Chicago delivery, as follows:

Beams and channels, 3 to 15 inches, inclusive, 1.86½c; angles, 3 to 6 inches, 1.86½c; angles, larger than 6 inches, on one or both legs, 1.96½c; beams larger than 15 inches, 1.96½c; zees, 3 inches and over, 1.86½c; tees, 3 inches and over, 1.91½c, with the usual extras for cutting to exact lengths, punching, coping, bending, or other shop work. Quotations on lots from store are as follows: All angles, 3 inches and larger, $2.25 per 100 pounds base; tees, 3 inches and larger, $2.30 per 100 pounds base; 3, 4, 7, 8, 9, 12 and 15-inch beams, $2.25 per 100 pounds base; 5, 6 and 10-inch beams, $2.50 per 100 pounds base; 18, 20, and 24-inch beams, $2.35 per 100 pounds base; 3, 4, 7, 8, 9, 10, 12 and 15-inch channels, $2.25 per 100 pounds base; 6 and 10-inch, 15-pound channels, $2.50 per 100 pounds base; 12-inch, 20½-pound channels, $2.35 per 100 pounds base; 5-inch channels, $2.75 per 100 pounds base.

Rails and Track Supplies.—Another quiet week was experienced in rails, no contracts of any moment having been closed. There is an extremely strong demand for spikes and track bolts, however, and early deliveries of either are hard to obtain. We quote standard sections, f. o. b. mill $28; light rails, 30 to 45-pound sections, $27 to $28; 25-pound, $28 to $29; 20-pound, $29 to $30; 16-pound, $30 to $31; 12-pound $31 to $32, and light sections down to 8-pound, $38 to $40, all f. o. b. mill. Track supplies are quoted as follows: angle bars, 1.50c to 1.75c; spikes, 2.10c to 2.30c; track bolts, 2.65c to 2.76c, base square nuts.

Merchant Pipe.—With the approach of spring, business increases in volume. The prospect of an early opening of lake navigation this year has stimulated a demand for pipe, and for the next month or two an active market is expected. The consumer's delivered cost during the season of navigation is from $1 to $2 less than when an all-rail haul is made and the trade makes a practice of stocking up heavily in the spring and summer months. Prices are firm and without change. We quote carload lots, f. o. b. Chicago as follows: ¾ to 6-inch black steel pipe, 78.35 per cent discount from list, and galvanized, 68.35 per cent. Minimum quotations from store are 76½ to 77 per cent discount on the base sizes, ¾ to 6-inch black steel pipe.

Boiler Tubes.—Producers and jobbers report a brisk movement in tubes. Official discounts are without change as follows:

	Steel	Iron	Seamless
1 to 1¼ inches	40.35	37.35	53.00
1⅜ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	
Up to 4¼ inches			50.50
6 to 13 inches	52.35	37.35	

Less than carload lots, from store, as follows:

	Steel	Iron	Seamless Steel
1 to 1¼ inches inclusive	40	35	42½
1¼ to 2¼ inches, inclusive	50	35	35
2¼ inches, inclusive	52½	35	50
2½ to 5 inches, inclusive	60	47½	42½

Cast Iron Pipe.—Demand for cast iron pipe continues very strong. Contracts placed this week with the United States Cast Iron Pipe & Foundry Co. include 2,500 tons of water and gas pipe by the city of Duluth, Minn., and 900 tons of culvert pipe by the Kansas City Southern railway. The city of New Orleans is in the market for 10,000 tons of pipe, the letting being advertised for May 15, while 1,000 tons are being figured on by the Eastern Wisconsin Railway & Light Co. The Cleveland contract for 2,500 tons mentioned last week, was awarded to the United States Cast Iron Pipe & Foundry Co. No change is noted in prices, and we continue to quote 4-inch water pipe, $31; 6, 8, 10 and 12-inch, $30; larger sizes, $29.50; gas pipe $1 extra.

Wire Products.—The demand for nails and fencing continues extremely brisk. Mills are crowded with specifications, and apparently are making no headway on their delinquent tonnage. The congestion on mill books is expected to be considerably worse than it now is when the season of lake navigation opens, for this period always brings with it a large increase in business from northwestern dealers. Prices are very firm, carload lots to jobbers, Chicago, delivery, being quoted as follows:

Wire nails, $2; painted barbed wire, $2.15; galvanized barbed wire, $2.45; smooth annealed wire, $1.85; smooth galvanized wire, $2.15; polished staples, $2.15; galvanized staples, $2.40. Carload lots to retailers, 5 cents higher

than above prices; less than carload lots, 15 cents higher.

Old Material.—Dullness is the main characteristic of the local market. Trading is at low ebb, and prices continue soft. Buyers will consider only attractive lots, and owing to the large accumulations of material on dealers' hands are in position to force concessions. Approximate quotations of local dealers are as follows, gross tons being given in the first paragraph.

Old Steel Rails (4 feet and over)	$15.00 to 15.50
Old Steel Rails (less than 4 feet)	14.00 to 14.50
Old Car Wheels	19.00 to 19.50
Old Iron Rails	21.00 to 21.50
Relaying Rails, subject to inspection	27.00 to 27.50
Heavy Melting Steel	13.00 to 13.50
Mixed Country Steel	11.50 to 12.00

We quote as follows, net tons:

No. 1 R. R. Wrought	$15.00 to 15.50
No. 2 R. R. Wrought	14.00 to 14.50
Shafting	17.00 to 17.50
Dealers' Forge No. 1	12.00 to 12.50
Wrought Pipe and Flues	11.50 to 12.00
No. 1 Cast, 150 pounds and less	13.00 to 13.50
No. 1 Mill	8.50 to 9.00
No. 1 Busheling	10.00 to 10.50
No. 2 Busheling	9.50 to 10.00
Country Sheet	8.00 to 8.50
No. 1 Boilers Cut	11.50 to 12.00
Boiler Punchings	14.00 to 14.50
Iron ar Axles	22.50 to 23.00
Steel Car Axles	19.00 to 20.00
Iron Axle Turnings	11.50 to 12.00
Cast Borings	9.00 to 9.50
Mixed Borings, etc	9.00 to 9.50
Machine Shop Turnings	11.00 to 11.50
Railroad Malleable	13.50 to 14.00
Agricultural Malleable	12.50 to 13.00
Stove Plate and Light Cast Scrap	10.50 to 11.00
Old Iron Splice Bars	17.50 to 18.00

CLEVELAND.

Increased Demand from Foundries.—Some Rail Orders Contingent on Strike.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, March 13.

Iron Ore.—Extremely cold weather in the Lake Superior region during the past week has caused apprehension among shipping interests, which now fear that the opening of navigation will be delayed considerably beyond the time originally set. Heavy ice is reported in Mud Lake and at the Soo the temperature has been well below zero. Negotiations with labor interests are still in progress, and, although as yet no adjustment of differences has been made, it is believed that no serious trouble will be encountered in this direction. Ore is moving steadily from the docks in good quantities. A number of sales of good size are reported, with Bessemer ore much sought and exceedingly scarce. Prices are on the basis of $4.25 for Old Range Bessemer.

Pig Iron.—In the local market the pig iron situation has improved slightly during the past week. Basic has become much firmer through the development of a buying movement of considerable extent. Inquiries pending from three large interests for tonnages will probably be closed and will cover the entire remaining output of local producers through the first half and well along into the second. This demand, in connection with the fact that basic is already comparatively scarce, and that a recent attempt to purchase a considerable tonnage in the Pittsburg district at current quotations failed, has established the price firmly at $17 valley. Bessemer is comparatively scarce with $17.25 valley the prevailing quotation and $17.50 demanded for small lots.

An increased demand is reported from foundries, and considerable business is being transacted, the majority of sales being for small tonnages, though with occasional good sized lots. Furnaces report an increasing number of requests for advance shipment, which they interpret to mean that foundries which have been running on a "hand to mouth" basis will shortly be forced into the market. An occasional lot contracted for the second half is at current prices, which continue $17 valley, or $17.75 delivered in Cleveland. The uncertainty of the coal situation has served to muddle the coke market and prices reported vary widely. Some contracting for second half requirements has been done at $2.25 ovens, while spot or quick delivery coke is on an average basis of $2.35. We quote Cleveland delivery as follows:

Bessemer	$18.10 to 18.35
No. 1 Foundry	18.00 to 18.50
No. 2 Foundry	17.50 to 17.75
No. 3 Foundry	17.00 to 17.50
No. 2 Southern	17.85 to 18.10
Gray Forge	16.35 to 16.85
Gray Forge, Southern	15.85 to 16.35
Lake Superior charcoal	19.50 to 20.00

Finished Materials.—The element of uncertainty which the threatened coal strike has instilled in the market is evidenced by a good-sized order of light rails placed during the past week contingent upon the continuance of operations in the coal district. A somewhat decreasing demand for finished lines generally is reported, though the mill which recently announced that it could take orders for structural shapes for prompt delivery is already sold well ahead and is practically out of the market on plates. In both cases premiums are being obtained when sought, and especially in structurals where a considerable demand for small lots to be delivered at once is noted with no dickering as to prices. Sheets are in active demand. Bar iron continues weak, the leading interest quoting 1.70c to 1.75c Youngstown, with independent mills somewhat lower. An agreement of western mills on a price basis is rumored. Local mills are sold well ahead.

Old Material.—The market is one of complete inactivity with only enough scattered dealing to show that prices are, if anything, on a lower level than a week ago. Trading is almost entirely between dealers, as mills have not yet entered the market. We quote f. o. b. Cleveland as follows:

Old Iron rails	$20.50 to 21.50
Old steel rails (over 6 feet)	16.00 to 16.50
Old steel rails (under 6 feet)	16.50 to 17.50
Old car wheels	16.00 to 16.50
Steel boiler plate	12.00 to 13.00
Steel axles	20.00 to 21.00
Malleable iron (railroad)	14.00 to 14.00
Malleable iron (agricultural)	13.00 to 14.50
Heavy steel	14.00 to 14.50
Country mixed steel	12.50 to 13.00

We quote net tons, as follows:

No. 1 R. R. wrought	14.50 to 15.00
No. 1 busheling	12.50 to 13.00
No. 1 machine cast	12.50 to 13.00
Iron axles	22.00 to 23.00
Axle turnings	11.00 to 12.00
Wrought turnings (free from cast)	9.50 to 10.50
Grate bars	9.50 to 10.00
Pipes and flues	12.00 to 12.50
Tank iron	10.50 to 11.00
Hoop and band iron	7.50 to 8.00
Sheet iron	6.50 to 7.00
Wrought drillings	9.50 to 10.50
Stove plate	10.00 to 10.50
Cast borings	7.50 to 8.00

CINCINNATI.

Increased Inquiry for Pig Iron Results in Lower Quotations.

March 13, 1906.

Pig Iron.—In this territory buyers have shown a more active interest in the market, and the aggregate of small orders has been larger than in the preceding week. There has been, however, keen competition among the selling interests to secure such business as was offered, and prices have suffered a decline as a consequence. On southern iron $13.75 Birmingham is openly quoted and it is stated in the trade that $13.50 has been done. On northern iron quotations are so irregular as to be difficult to establish, but from the best information obtainable in the trade it appears that $16.50 for No. 2 foundry at furnace may be done, while $16.75 and $17.00 are freely quoted. It would seem that price concessions at this time are the result of a prolonged period of dullness and lack of buying rather than any apparent weak features in the situation. All reports in regard to the melt of foundry irons continue to reflect enormous consumption, and buyers are calling for iron on their contracts and requesting furnaces to anticipate shipments. Quite a number of the orders taken this week were for second quarter delivery and were placed by buyers who thought they had covered for the first half of the year, but found they had consumed more iron than they anticipated. In addition to this, reports of production being interfered with both in the north and the south are coming forward, one important Alabama interest has banked its furnaces and a large northern stack has met with an accident. But few furnaces can be located that have any large stock of iron on hand, especially of the higher grades. In the face of such a situation it is, nevertheless, true, that there are enough furnaces eager for business to reduce prices, to

secure orders, and it is notable that all inquiries for even moderate tonnage bring out a full quota of traveling representatives for pig iron sales agencies. The week's developments leave the market in an unsettled condition, as it is now difficult to tell what prices are likely to be made on any business that comes to light. We quote f. o. b. Cincinnati:

Southern Foundry No. 1	$17.00 to 17.50
Southern Foundry No. 2	16.50 to 17.00
Southern Foundry No. 3	16.00 to 16.50
Southern Foundry No. 4	15.25 to 15.50
Southern Foundry No. 1, soft	17.00 to 17.50
Southern Foundry No. 2, soft	16.50 to 17.00
Gray Forge	14.75 to 15.25
Northern Foundry No. 1	18.40 to 18.65
Northern Foundry No. 2	17.90 to 18.40
Northern Foundry No. 3	17.40 to 17.90
Jackson County Silvery, 8 per cent	21.15 to 21.65
Southern Charcoal	22.75 to 23.25

Finished Material.—The market continues firm and there has been no improvement in deliveries from mills. Jobbers report a continued active demand. Bar iron is quoted 1.75c to 1.80c and the recent advance in sheets is well sustained. We quote: steel bars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets, No. 10 and No. 12, in car lots are 2.58c. We quote black sheets, No. 27 at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.85c; No. 27, 2.75c; No. 16, 2.35c; No. 14, 2.25c; No. 12, 2.15c. Tank plates are firm and sell out of store at 2 to 2.10c for ¼-inch and 2.10c for 3-16, Nos. 8 and 10. Beams and channels are quoted at 2.25c to 2.35c from stock and angles at 2.10c to 2.15c for base sizes.

In merchant pipe there has been no change and prices are fairly well maintained. We quote f. o. b. Cincinnati:

MERCHANT PIPE.
(Basing Discounts)

	Steel Pipe		Guaranteed Wrought Iron Pipe	
	Black Per cent	Galv. Per cent	Black Per cent	Galv. Per cent
⅛ and ¼ inches	69.7	53.7	....	....
⅜ inch	73.5	61.3	....	....
½ inch	73.7	61.7	....	....
¾ to 6 inches	77.7	67.7	....	....
7 to 12 inches	72.7	57.7	....	....

Coke.—The market is more active as it is believed consumers are stacking coke in anticipation of possible coal strike troubles. There is no quotable change in prices, but the market is a shade firmer than a week ago. Quotations in the leading coke producing districts are as follows:

Wise County, Va. Furnace Coke prompt shipment	$2.50 per ton
Wise County, Va. Foundry Coke prompt shipment	3.00 to 3.25 per ton
Pocahontas Furnace Coke on contracts	2.50 per ton
Pocahontas Foundry Coke on contracts	2.75 to 3.00 per ton
Connellsville Furnace Coke prompt shipment	2.50 per ton
Connellsville Foundry Coke prompt shipment	2.90 to 3.25 per ton
New River Foundry Coke on contracts or prompt shipment	3.00 to 3.25 per ton
New River Furnace Coke, prompt shipment	2.50 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.65 per ton on $9.00 pig iron, plus 17 per cent of the advance on pig iron above $9.00 Birmingham

Old Material.—The market is easy and prices continue irregular. We quote f. o. b. Cincinnati:

Old No. 1 railroad wrought, net tons	$14.00 to 14.50
Cast machine and foundry, net tons	12.50 to 13.00
Old iron rails, gross tons	20.00 to 20.50
Old steel rails, gross tons	15.50 to 16.00
Old short lengths, gross tons	16.00 to 17.00
Old iron axles, net tons	22.00 to 23.00
Stove plate, net tons	10.00 to 10.50
Wrought turnings, net tons	9.50 to 10.00
Cast borings, net tons	7.00 to 7.50
Car wheels, net tons	16.00 to 17.00

NEW YORK.

Pig Iron Market Slightly More Active. Transactions Larger in Volume And More Inquiry.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., March 12

Pig Iron.—With consumption at its maximum and likely to increase and pressure for forward delivery on old contracts as urgent as at any time during the past season, the situation in the pig iron trade is about as healthy as it could be even though sales have not been as brisk as the selling agents could wish. Conditions have changed very little during the week except that individual sales are somewhat larger and a fair volume of inquiry has begun to come in. Calls for bids are not urgent, but they at least show an interest in the future supply of iron. The total volume of sales has not been inconsiderable, the aggregate being from 12,000 to 15,000 tons. Most of the transactions have been in northern foundry chiefly in small lots for immediate shipment. Neither producers nor consumers seem as yet ready to enter negotiations for delivery in the third quarter. The heaviest buying has been in low grades for pipe foundry consumption, but the purchases of melters for machinery and general foundry purposes have been nearer the normal than is generally supposed. Sales of basic have not been heavy, only 3,000 or 4,000 tons being accounted for, but the pressure for delivery is as great as it has been at any time this year. Inquiries for foundry grades representing some 10,000 tons are going the rounds including one for 2,500 tons from the General Electric Co., which was withdrawn temporarily a few weeks ago, and one from a pump works calling for deliveries to begin March 17. Many of these inquiries are, however, not taken seriously by the producers as they have every appearance of being advanced merely as feelers. Prices are fairly well maintained, the chief producers holding firm to the quotations which have prevailed for several weeks. The sales of the week taken as a whole seem to give the impression that concessions have been rather frequent, but as a large proportion of the transactions concern off grades, the significance is not great. Ferro-manganese is weaker and lots may now be secured at prices little if any above the normal. Several large contracts for iron pipe to be let by the city water department including specifications for 26,000 tons of cast iron sections are of interest to the pig iron trade as sure to bring additional business from the successful bidders.

The flat rejection of the miners' demands by the coal operators has revived the confidence of pig iron producers. In the event of a strike, even if confined to the anthracite region, it is expected that prices will promptly rise and that the furnaces of the south will be in the best position to reap the advantage.

The following are prices at tidewater:

Northern No. 1 Foundry	$18.25 to 19.00
No. 2 Foundry	17.75 to 18.50
No. 2 Plain	17.50 to 18.00
No. 1 Southern Foundry	18.00 to 18.75
No. 2 Southern Foundry	17.50 to 18.50
No. 3 Southern Foundry	16.50 to 17.00
No. 4 Foundry	16.75 to 17.25

Pig Iron Certificates.—Certificates have excited little interest on the New York Produce Exchange during the week and warrants have sold at slightly lower prices. Trading in the new standard foundry contracts can not begin until two or three weeks in the future. Sales include 100 tons regular, June, at $16; 100 tons March foundry, $16.25; warrants, 100 tons Secaucus, $15.70; and 900 tons, Alabama, No. 2, $13.25. Foundry warrants follow:

	Bid.	Asked.
Cash	15.75	16.75
March	15.90	16.75
April	16.10	16.75
May	16.25	

Finished Iron and Steel.—The week has been quiet as far as new business in finished products is concerned. None of the big contracts which are to be let for building material in this city have as yet materialized and the aggregate of small lots has also been small. This apparent inactivity alarms no one, however, for the business in hand is sufficient for the moment and an immense tonnage for the future is assured. The American Bridge Co. secured a few small orders for bridges from the Florida & East Coast railroad; and a contract for a hotel in Brooklyn requiring about 3,000 tons was let. Bids have been submitted for the material for the "Evening Post" building, but the contract has not yet been awarded. Contracts for rails have been small in volume, but considerable tonnages are to be placed within a few days. The rail mills are so well provided with work that the question of delivery is a serious one in the consideration of new business. Plates have been in very satisfactory demand, the run of current orders being about normal. Several moderate sized contracts

for boiler and ship plates were placed during the week. Bar iron continues to be quiet and weak, sales being only moderate in volume. Following are the prices at tidewater: Angles, 3 to 6 inches x ¼ inch and heavier, 1.84½c; beams, 3 to 15 inches, 1.84¼c; tees, 3 x ¼ inch and heavier, 1.89½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine boiler, 2.41½c; refined iron bars, 1.74½c to 1.84½c; soft steel bars, 1.64½c to 1.84½c; sheets, No. 28 black, 2.40c.

The bookings of the American Bridge Co. for the week have been fairly up to the normal both in quantity and character. The total is not far from 10,000 tons. Among the orders secured is one for 3,200 tons for an office building in Chicago, another for 400 tons of steel for Pittsburg mainly for extensions of corporation plants, and a third for 1,100 tons for the American Shipbuilding Co.'s plant at Lorain to be used in the construction of a fitting-up shop and crane runways. A considerable share of the business consists of turntables and small bridges for railroads. A notable increase in the size and capacity of the turntables ordered is reported, calls for 80-foot lengths being frequent although the 70-foot tables still seem to be the standard. The 60-foot table is being displaced by longer lengths as affording facilities for turning long cars as well as motive power units.

Old Material.—The market has shown little if any change during the week. Consumers are still indifferent and seem to be well supplied. There is no great pressure to sell and the large dealers are disposed to await developments. Sales of heavy melting steel scrap making a total of about 450 tons are reported; also a few lots of old steel rails for delivery in the south. The demand for all sections of relaying rails has improved and sales of 3,000 tons of 56 and 60 pound sections are announced, to be delivered in New England. The following are prices approximately f. o. b. tidewater:

Old iron rails	$21.00 to 22.00
Old steel rails, long lengths	14.50 to 15.00
Old steel rails, short pieces	14.00 to 14.50
Relaying rails	23.00 to 24.00
Old car wheels	18.00 to 19.00
Old iron car axles	24.00 to 25.00
Old steel car axles	18.00 to 19.00
Heavy melting steel scrap	14.25 to 15.00
No. 1 railroad wrought scrap	18.00 to 19.00
Iron track scrap	16.50 to 17.00
Wrought pipe	13.50 to 14.00
Cast borings	10.00 to 10.25
Wrought turnings	14.00 to 14.50

PHILADELPHIA.

Strike Effects Not Feared by Furnacemen.—Bar Iron is Weaker.

March 13.

Pig Iron.—No essential change is to be noted this week from the conditions which have prevailed for the past two or three weeks. The more threatening aspect of the coal situation, due to the anthracite operators' refusal of the miners' demands, has injected a fresh element of uncertainty, but, even if there is a strike, which most well informed persons still regard as unlikely, eastern furnace men do not expect it to weaken their position. Most of the furnaces in the Lehigh and Schuylkill regions use a large proportion of anthracite with coke, and any enhanced value of the fuel would certainly lead them to advance the prices of their pig iron. In the meantime most of them hold firmly to the prices which have ruled for some time. Of course an occasional 10 or 15 cents is clipped off now and then to hold a valued customer, but most of the producers feel so confident of their position that they refuse to make concessions. They realize thoroughly that if the bars are once let down, there is no telling where prices will bring up. Comparatively few sales have been reported during the week. Basic and low phosphorus are practically all sold out, and the demand is chiefly for foundry irons. Customers are still clamorous for deliveries, and most furnace men confess that they are considerably behind in filling orders. Prices may be quoted as unchanged, as follows:

No 1X Foundry	$19.00 to 19.50
No. 2X Foundry	18.50 to 18.75
No. 2 Plain	17.75 to 18.00
Standard Gray Forge	16.25 to 16.75
Basic	17.90 to 18.10
Low Phosphorus	25.50 to 26.00
Southern No. 2X, rail	18.75 to 19.00

Finished Material.—Reports from the mills point to a slackening in the volume of orders, but not in activity. Bar iron is a little weaker in price. The easier tone is not unnatural and is not regarded as indicating any serious decline in prices. These may be quoted as follows:

Beams, channels and angles according to specifications, 1.83½c to 2.15c; refined iron bars 1.73½c to 1.78½c; steel bars, 1.63½c to 1.73½c; plates, 1.83½c to 1.88½c.

Old Material.—A little buying by the mills is reported, but it has not been enough to prevent several lines of scrap from touching still lower prices. Dealers believe that a deliberate effort is being made to bear the market by short selling, and that prices have not yet reached the bottom figures desired by the speculators. The market continues dull and the following figures may be quoted:

Old steel rails	$16.00 to 16.25
No. 1 steel scrap	16.00 to 16.25
Old steel axles	20.00 to 20.50
Old iron axles	24.00 to 25.00
Old iron rails	22.00 to 22.50
Old car wheels	18.00 to 18.50
Choice scrap, R. R. No. 1 wrought	18.50 to 19.50
No. 1 yard scrap	17.00 to 17.50
Machinery scrap	15.75 to 16.25
Low phosphorus scrap	21.00 to 22.00
Wrought iron pipe	14.50 to 15.00
No. 1 forge fire scrap	14.75 to 15.25
No. 2 forge fire scrap, ordinary	11.50 to 12.00
Wrought turnings	13.50 to 14.00
Axle turnings, heavy	14.00 to 15.00
Cast borings	10.00 to 10.50
Stove plates	12.00 to 12.75

Metal Market

NEW YORK.

Pig Tin.—The market after experiencing a more active demand closed quiet. Today's quotations follow: Spot, 36.05 to 36.20; March, 36 to 36.20; April, 35.85 to 36.20; London, £165 10s and £164 5s; arrivals for the month to date, 875 tons; afloat, 2,940.

Copper.—There has been only moderate activity in refined copper but the market continues steady. Today's closings follow: Lake, 18⅜ to 18⅝; electrolytic, 18⅛ to 18⅜; casting, 18 to 18¼; London's closing today: £80 and £78 5s. Exports for the month to date, 4,398 tons.

Lead.—The market is very quiet but has been well sustained. London has experienced a slight decline. Today's closings, 5.35 to 5.45; St. Louis, 5.27½; London, £15 16s 3d.

Spelter.—The demand for refined spelter is only moderate and the market is quiet. Today's closings, 6.20 to 6.30; St. Louis, 6.20; London, £24 10s.

Antimony.—There is a stronger tone and a fair demand. Today's Cookson's, 16c to 17c; Hallett's, 15¾c to 16¼c; other grades, 15¼c to 16c.

BALDWIN STEEL CO. TO BUILD IN SOUTH.

The Baldwin Steel Co., manufacturer of the Ajax and Hudson brands of high speed tool steel and other varieties of fine steel, has purchased ground at Charleston, W. Va., as a location for a new plant which will be erected at once to be ready for operations in the early fall. The present plant at Cold Spring-on-the-Hudson, New York, is to be abandoned, all the activities of the company being centered in Charleston.

DeCamp Bros. & Yule Iron, Coal and Coke Co., St. Louis, agents in the St. Louis territory for the Trussville, (Ala.) pig iron, announces having also secured the exclusive sales agency of this brand of iron in the Chicago territory. A. B. Stevenson, with offices at 1101 Fisher building, is the company's manager in this district.

Proposed Georgia Plant.—The Etna Steel & Iron Co., Cedartown, Ga., has been incorporated with a capitalization of $5,000,000, and formal application for a charter will shortly be made by the organizers, Alexander Hamilton, T. N. Barnsdall, S. Harrison Wagner, and W. B. Lowe.

STEEL PLANT PLANS

Presented at Annual Meeting of Sloss-Sheffield Steel & Iron Co.

The annual stockholders' meeting of the Sloss-Sheffield Steel & Iron Co. was held in Jersey City March 14. The annual report of President J. C. Maben was presented. Accompanying it were plans and blue prints for a steel plant, prepared in accordance with a resolution of the stockholders at the last annual meeting. President Maben merely laid these before the meeting without recommendations.

The annual report of the fiscal year ending Nov. 30, 1905, showed a remarkable increase in net earnings and surplus over the preceding year. The total net profits were $1,485,282, an increase over last year of $713,915. After deducting the seven per cent dividend on the preferred stock the surplus was $361,079, equal to seven and thirty-six-hundredths per cent on the common stock. The net profits on pig iron were $1,117,148, within $22,000 of the profit on iron for 1903, which, says President Maben, "was by far the largest since the origin of the company and greatly in excess of that of any other year."

Car Shortage Felt.

"Your furnaces," he continued in his report, "produced 20,000 tons less pig iron last year than they did the previous year, but over 72,000 tons more than in any other previous year. The decrease in output last year was due to several causes, the great scarcity of labor and the inability of the railroads to handle promptly the raw material of the furnaces being the chief causes.

"The strike among our coal miners, which was inaugurated on the first of July, 1904, continues, but we have maintained our mines on the open-shop basis, and the effects of the strike are being felt less and less. The output of coal shows a decrease from two previous years, but this was due more to our inability to procure cars and to the great scarcity and inefficiency of labor.

"The profits from business of the last year would have been considerably greater had the railroads been able to furnish cars for the transportation of our iron. No. 1. furnace was out of blast during all of December and until January 25. The stack was rebuilt and a new cast house erected. The No. 3. furnace was out from June 1 to August 15 to be repaired. All of the other furnaces were at work during the entire year, except for a very brief period.

New Work Undertaken.

"The only important new work undertaken in the company's coal field during the year was the development of the Bessie mine, where everything is being done in a most substantial way.

"Seven new boilers have been installed during the past year at the Sloss mines and additional houses for the employes have been built. A new large reservoir, insuring an abundant supply of water, has also been constructed. The management decided a few months ago to open up the company's ore mines near Irondale which were closed down some years ago. The output of these mines is now about 400 tons a day and will be largely increased within a short time."

The directory board, at a meeting Monday, declared the regular quarterly dividend of 1¾ per cent on the preferred, and the regular semi-annual dividend of 2½ per cent on the common stock. Both are payable April 2.

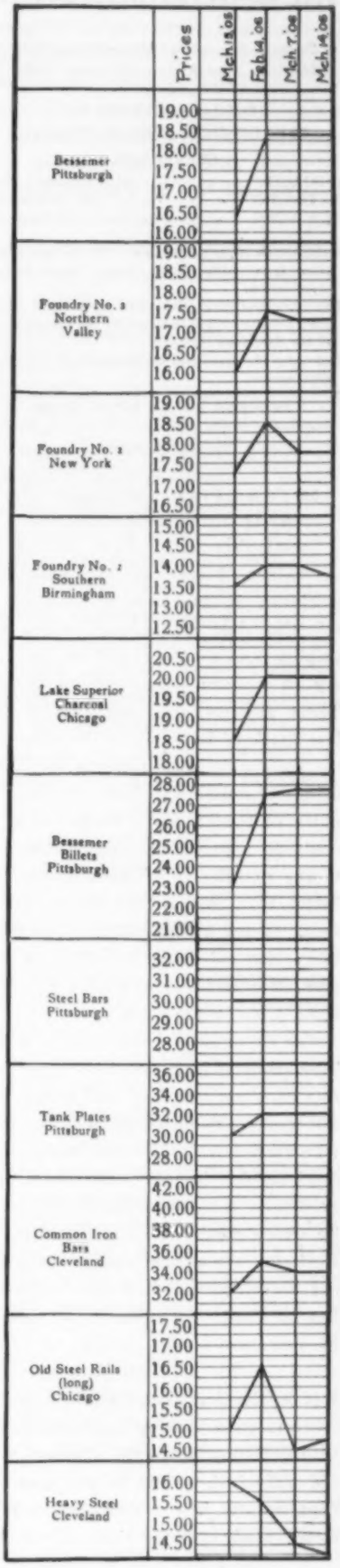
NEW PLANT OF THE BETHLEHEM STEEL CO.

The $12,000,000 improvements now under way at the Bethlehem plant of the Bethlehem Steel Corporation are expected to be completed in about fifteen months. The number of men employed will be nearly twice the present force. Ground is being prepared for the new construction and a number of contacts for buildings, machinery, etc. have been let. The plans include the building of five large, modern blast furnaces, a coking plant, the first unit of which will embrace 50 ovens, a drop forge plant and a shop for the manufacture of fine machinery and tools. It is understood that for the machine and tool shop alone $2,000,000 has been set aside.

The structural steel mills which form an important part of the improvements have excited a great deal of interest, for the process to be employed has never before been used on a large scale in this country. The process differs little from the Gray process developed several years ago at Duluth, and permits the rolling of very large beams and sections hitherto built up of smaller riveted sections. This is rendered possible by the use of lateral and auxiliary rolls so mounted that the axes form angles with the axis of the main roll. The process is in operatin in a small mill in Luxembourg, and one of the objects of C. M. Schwab's flying visit to Europe last summer was the inspection of this plant with a view toward adopting the process for Bethlehem.

The Ralston Steel Car Co., Columbus, O., has begun the delivery of cars on its heavy order for the Ohio Central. The capacity of the plant is to be largely increased.

PRICE CHART.



THE IRON TRADE REVIEW

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INTENSIFIED PRODUCTION AND THE INDIVIDUAL.

Sociologists and others profess to see grave danger to the individual workman in the various systems of scientific shop management which exemplify both the spirit and the machinery of modern intensified production. These systems, they say, destroy the last spark of initiative in the minds of the men, and reduce them to mere machines of muscle and bone. It was the glory of the old time worker that he could do a particular piece of work in a way peculiar to himself, unlike and better than the method of any other man. It was his individuality, his mentality, that aided him to excel and surpass all others and nourished a wholesome pride in his work.

The exponents of the systems which have rendered it possible to increase production three and four fold admit that the most valuable employe is the man who carries out orders and is the most machine-like in his movements, for productive labor is mechanical regularity with a minimum of lost motion. A workman cannot be allowed to carry out his own notions in the work which he has on hand. An order is as rigid in its demands as the placing of a set screw or the adjustment of a cam. Hence, the first impression which one receives upon visiting the scientifically managed shop is that the elimination of the individual, except in the directing departments, is complete, but a little closer study reveals that this is not entirely true. The elimination of individuality is real only so far as that individuality is actually harmful. Superior initiative is at a premium. Instead of being useful to one workman alone, it is applied to every workman in the shop. The keynote of intensified production has been aptly characterized by one of its chief advocates in this country as team work. Instead of many heads acting as units without regard to the general scheme, all heads and hands act as one. Every motion is predetermined and every difficulty is foreseen and provided for. The exercise of discretion is not permitted because it is not needed. Minds relieved from the worries and questions incident to unit action are free to busy themselves with matters which affect the entire team.

That the value of individual ingenuity is fully appreciated by those who are astute enough to adopt the team system is shown by the fact that wherever scientific management has been introduced there is also a provision for collecting and utilizing the results of mental activity among workmen. While the employe is carrying out orders with machine-like discretion he is at liberty to be thinking about any improvement which he can suggest. A fair reward for suggested improvements which can be applied to the entire shop is certainly more helpful and stimulating to the individual than the secret use of that improvement to no advantage to himself, except, perhaps, as it may effect a slight lightening of labor.

THE PLETHORA OF SCRAP.

Rarely has the market in any iron and steel commodity moved more at variance with expectations than has the scrap market in the past few months. Last fall found the iron trade in expectation of a very busy winter, with good demand for all raw materials. Ample preparations were made by both dealers in and consumers of scrap for the heavy consumptive demand and the usual curtailment of movement into the market of scrap, consequent upon bad weather. As the winter period has progressed, scrap has become more plentiful and prices have steadily fallen. It is fashionable in some quarters to blame the slump upon the weather. There is more in it than that. We are now on the verge of spring, and if the slump has been caused simply by scrap reaching the market sooner than expected, a correspondingly smaller quantity of scrap is going to find its way into the market during the next few months. Only so much scrap is produced, conditions as to scrap production not having changed, and the material can come into the market but once. A reaction then should be in order, but the market is scrutinized in vain for premonitions of it.

The fact is simply that scrap is not the necessity to the basic open-hearth steel industry which in the early days it was supposed to be. In 1899, when we made two million tons of basic open-hearth steel ingots, the country was scoured for scrap, and material was used which had lain for years where it had been abandoned. Last year our production was probably about quadrupled, and there is plenty of scrap left.

Two or three years ago the Carnegie Steel Co. was a buyer of scrap. Then it stopped. The Clairton Steel Co. was a large buyer of scrap. It was absorbed by the Carnegie Steel Co., yet the latter did not become a buyer. The company increased the capacity of its old plants, and started the Donora plant, and still did not become a buyer. It has instead been a seller, disposing of a large part of its own low-phosphorus scrap to outsiders. Another Pittsburg concern has become a large producer of basic open-hearth steel and instead of buying scrap it has been trading large quantities of its own scrap for crude steel.

The ordinary direct metal process and the Talbot, Monell and other processes, together with the facility with which scrap is made in both Bessemer and open-hearth plants by liberal cropping, have killed the necessity for steel manufacturers to use large quantities of scrap, or any quantity of old material at all, except possibly in the case of detached open-hearth plants. Even operating under the open-hearth process alone, with the adjunct Bessemer vessel, the leading southern steel interest has been able to dispose of

considerable quantities of its own scrap.

The elimination of the necessity for using scrap has reduced the problem to one of cost. It has been a pet theory of scrap dealers to regard heavy melting stock as worth a price involving a certain proportion to pig iron, which is a true enough principle, if the ratio is the correct one, and if the value of pig iron be properly taken. The principal fallacy in the argument lies in assuming that the value of pig iron, to the possible buyer of scrap, is the market price of pig iron. It is not the market value, but the cost of producing the pig iron, and in times like these there is a very important disparity. The fact that certain producers of basic open-hearth steel, who do not buy scrap, do occasionally buy pig iron in the open market does not vitiate this argument. The reason they buy pig iron occasionally, and not scrap, is "another story."

THE AMALGAMATED ASSOCIATION.

The sub-lodges of the Amalgamated Association of Iron, Steel and Tin Workers are making preparations for the thirty-first annual convention by the selection of delegates. Later will come the formulation of demands for scale changes which, by a constitutional provision, must be sumbitted beforehand and printed in the program to entitle them to consideration in the convention.

The forthcoming convention bids fair to be the tamest the Amalgamated Association has seen for many years. There will be no important issues, because the manufacurers on the one side have already gained all the important points they desired, and the association on the other side has lost the power to make and prosecute issues. The history of the Amalgamated Association is the history of the adherence to a wrong principle, working out just as should be expected in steady loss of strength and prestige. The Amalgamated Association has depended for its hold on the trade upon the skill of its members, in relation to the following of certain processes with certain machinery. Had the Amalgamated Association possessed the conception of skill *per se* instead of skill simply in relation to processes and machinery, when there was a constant movement towards better processes and better machinery, its history would have been different. It has not avowedly opposed improvements, but it has done far worse. To have openly and confessedly opposed improvements would have been to fight with poor weapons, but to have known what they were. Instead, the Amalgamated Association has unconsciously linked its skill indissolubly with processes and machinery so that in defending the former it had to oppose changes in the latter. Thus in one branch of iron and steel manufacture after another the trade has grown away from it because it was too stubborn to follow.

Since the scope of the association has become confined almost entirely to the iron, sheet and tin plate branches of manufacture it has indulged itself in the error of thinking that it has been holding the umbrella for the workmen in the non-union mills. The simile does not in reality fit the facts. One who holds an umbrella is usually well protected himself. If the Amalgamated Association has held an umbrella it has not held it sufficiently well over itself. If it has maintained wages, as it claims, it has not guaranteed to its members steady employment at those wages. The men in the non-union mills, whether working for slightly lower wages or not, have had steadier employment and in the long run have, in the majority of cases, fared better as to practical results.

For the forthcoming wage settlement of the Amalgamated Association with the mills with which it customarily treats there are no signs of an important issue. In the past two years there have been two important issues which the sheet and tin plate manufacturers made and on which they gained victory without difficulty, one for the reduction of wages in the spring of 1904 and the other for the abolition of the output limit in the summer of 1905. In both cases the manufacturers prepared for a struggle by accumulating large stocks, particularly of tin plates, the large number of non-union mills in the sheet branch making it less necessary to accumulate stocks of sheets. In both instances the men bowed to the inevitable, made inevitable merely by simple preparations on the part of the manufacturers, and yielded without a real struggle. No such preparations are being made this year, and certainly the Amalgamated Association is not in position to create and prosecute issues of its own. Accordingly there is no likelihood of any struggle whatever.

For years there has been an opportunity for the Amalgamated Association, by a reformation of its fundamental principles, to make itself an important power in the iron trade, but so far from grasping at opportunities has it been that it has made a record in recent labor movement history for inability to make the simplest and most palpably desirable improvements. Its very scale book is involved and misleading, and fenced about with traditions. In the sheet scale it requires payment of certain men by the ton and of certain other men by the turn, perpetuating acrimony between different classes of its members and violating one of its cardinal principles, that wages per ton shall be uniform in all mills under its jurisdiction. In the non-union sheet scale all the skilled men are paid a certain rate per ton. All through the scale there are foot notes which fail to apply to present conditions. One, for instance, has run without the change of a word for at least more than a decade, and provides that "in order to . . . avoid the increasing custom of" doing a certain thing such and such a thing shall be done. Will that custom never stop increasing? Thus the association publishes broadcast that in an industry whose kaleidoscopic changes have startled the world it stands for absolutely no change—not so much as the correction of grammatical errors, indeed, in the book which decrees its rates of wages and which manufacturers are asked to sign.

The convention of the National Metal Trades Association to be held in Cleveland next week promises to be of unusual importance. The proposed co-operation with the National Founders' Association is outlined in the program.

LAUNCHING OF THE DAVID Z. NORTON.

The steel steamer David Z. Norton building for Capt. W. C. Richardson and others of Cleveland, was successfully launched at the Cleveland yard of the American Ship Building Co. on Saturday morning last. The steamer was christened by Miss Julia Paige Norton, niece of the well known ore shipper in whose honor the steamer is named. At the conclusion of the launch, luncheon was served to the launching party at the Colonial hotel, speeches being made by Capt. W. C. Richardson, Mr. D. Z. Norton, Mr. C. O. Jenkins, Mr. Frank S. Masten and Mr. R. T. Gray. Those present were: Mr. and Mrs. David Z. Norton, Miss Julia Paige Norton of Toledo, Capt. W. C. Richardson of Cleveland, Mr. and Mrs. J. C. Siegel of Erie, Mr. and Mrs. R. T. Gray of Detroit, Capt. Thomas Wilford of Lorain, Mr. and Mrs. George Harrison, Miss Hemmegan, Miss Heffron, John Ashley, Mr. S. E. Stebbins, Mr. C. O. Jenkins, Mr. C. E. Richardson, Col. J. T. Kelly, T. H. Paine, D. H. Cheney, Capt. and Mrs. Thomas Jones, George M. Black, W. C. McMillan, Capt. J. J. H. Brown of Buffalo, Capt. M. Mills of Tonawanda, J. J. Rardon of Chicago, J. A. Weisback of Buffalo, James McGiffert and Jay Amsden of Ashtabula and W. S. Brainard of Toledo.

The new steamer is 500 ft. over all, 480 feet keel, 52 feet beam and 30 feet deep. She will have triple-expansion engines with cylinders 22½, 36 and 60 inches diameters by 42-inch stroke. Steam will be supplied by two Scotch boilers 13 feet 9 inches in diameter and 11½ feet long, to be fitted with Ellis & Eaves induced draft. She differs from the usual type of vessel in the fact that her hatches are spaced 24 feet centers and are 12 feet fore and aft.

DAVID Z. NORTON.

The Norton will be sailed by Capt. Thomas Wilford and James Falconer will be her chief engineer.

TOPPING'S TOUR OF INSPECTION.

(Special Telegram.)

Birmingham, Ala., March 14.—John A. Topping, president of the Republic Iron & Steel Co., with assistant general sales agent and traffic manager are in this district inspecting properties. The directors will inspect properties also on March 23 and directors of Republic and Tennessee companies will hold a meeting in this city.

The Columbus Malleable Iron Fittings Co., Columbus, O., has been formed by Leo Lindenberg and R. D. Simpson for the manufacture of malleable iron pipe fittings.

PLAN OF CO-OPERATION

Of the N. M. T. A. and N. F. A. to be Considered at Cleveland.

The program of the eighth annual convention of the National Metal Trades Association, to be held at the Hollenden hotel, Cleveland, March 21 and 22 is as follows:

WEDNESDAY MORNING.

10 A. M.:
1. Call to order.
2. Address of Welcome by Hon. Tom L. Johnson, Mayor of Cleveland.
3. Roll Call.
4. Reading of Minutes.
5. Selection of Committees.
   - *a.* Nominating Committee for 1906-1907.
   - *b.* Auditing Committee.
   - *c.* Committee on Ways and Means.
   - *d.* Committee on Wages and Hours.
   - *e.* Committee on Strikes and Lockouts.
   - *f.* Committee on Constitutional Amendments.
   - *g.* Committee on Convention.
6. Call for Resolutions.

11 A. M.:
7. Report of J. W. Gardner, Pres.
8. Report of F. K. Copeland, Treas.
9. Report of Robt. Wuest, Secy.

RECESS.

WEDNESDAY AFTERNOON.

2 P. M.:
10. Reports of Standing Committees.
    - *a.* Finance Committee.
    - *b.* Report of Committee on Co-operation of the National Metal Trades Ass'n with the National Founders Ass'n.

Discussion.
Adjournment.

WEDNESDAY EVENING.

7 P. M.:
11. Informal Complimentary Dinner tendered the members of the National Metal Trades Association by the Manufacturers of the City of Cleveland, in the Banquet room of the Hollenden Hotel.

THURSDAY MORNING.

9 A. M.:
12. "Paper on Profit-Sharing as a Peace and Profit-Maker," By R. M. Downie, Sec'y. Keystone Driller Co., Beaver Falls, Pa.

9:30 A. M.:
13. The Possibilities of Organization, By I. H. Cone, Ass't. Sec'y. the National Metal Trades Association.

10 A. M.:
14. Further Consideration of Plan of Closer Co-operation with National Founders' Ass'n.

RECESS.

THURSDAY AFTERNOON.

2 P. M.:
15. Discussion on Outside Erection Work.

5 P. M.:
16. Reports of Convention Committees.
17. Report of Nominating Committee.
18. Election of Officers.

ADJOURNMENT.

Proposed Plan of Co-Operation.

The recommendations of the committee on co-operation of the N. M. T. A. and N. F. A. are as follows:

1. That both associations should hold their annual convention at the same place on consecutive days.

2. That an administrative council having entire jurisdiction over the affairs of both associations, should be formed as follows: The National Metal Trades Association to elect five members; the National Founders' Association to elect five members.

Each association shall also elect a

president and vice president, who shall be ex-officio members of the administrative council. The administrative council thus formed shall elect a commissioner, secretary, treasurer and chairman, and select such employes as will be necessary to conduct the business.

The chairman of the administrative council, together with the two presidents of the respective organizations, shall constitute an executive committee, to whom shall be delegated the powers of the administrative council when it is not in session.

The president and vice president of the two associations shall not be eligible to the office of chairman of the administrative council.

The chairman of the administrative council must be a member of that body, but the commissioner, secretary and treasurer may or may not be members of the administrative council. The treasurer may be a bank or trust company if the administrative council shall so elect.

3. That the offices of the two associations be located in the same building and operated under the directions of the Commissioner and administrative council.

4. The lawless acts sanctioned by the unions with which we have to deal compel both associations to do a great deal of expensive work in an effort to prevent violence and other forms of outrage. We believe that this work, which is of common interest to the members of both associations, can be carried on jointly, and that it will thus be rendered far more effective than it would otherwise be.

5. After a careful examination of the financial history of the two associations, we are thoroughly convinced that the plan of co-operation suggested will tend to a reduction in the operating expense of each association, and that such reduction will eventually tend to the gradual reducing of the cost of membership in the respective associations and will add greatly to the strength of both associations, the efficiency of the work and the value of membership.

6. We recommend that the administrative council shall maintain separately the defense funds of each association to which shall be charged all the expenses for the defense of its respective members. This fund shall be expended under the direction of the administrative council.

7. The administrative council shall be governed in its action by the *Declaration of Principles* and *Outline of Policy* as adopted by the respective associations, which are now practically identical.

8. We respectfully suggest for the consideration of the administrative council of the National Metal Trades Association that they take such action at their first meeting, which will provide for calling a special convention of their association as early as possible, to ratify their action, provided the National Founders' Association adopt this plan of co-operation at its convention in November.

Acting Commissioner Wuest of the N. M. T. A. is advising members that in addition to the courtesy of free service over the lines of the Western Union and Postal Telegraph Co. for social messages, the American Telephone & Telegraph Co. popularly known as The Long Distance Co. has tendered to members attending the convention at Cleveland on March 21 and 22 toll line and long distance service over its lines for social messages, without charge, between the hours of 6 P. M. and 8 P. M.

EDWIN BINDLEY.

DEATH OF EDWIN BINDLEY.

Pittsburg has suffered a distinct loss in the death of Edwin Bindley, which occurred at his residence, Fifth and Aiken avenues, on Saturday, March 10, after a brief illness with pneumonia.

Mr. Bindley was born in the first ward in that city March 10, 1842. A short time later the family removed to the sixth ward, where his father, the late John C. Bindley, was for many years a prominent contractor. Mr. Bindley attended the sixth ward public schools and finished his education in Prof. Smith's academy, after which he became associated with his father, and by reason of strict and energetic attention to his duties, he soon acquired a thorough and practical knowledge of the business and while still a very young man, bought his father's interest and was so successful that in 1882 he had acquired a handsome competency, which enabled him to retire from active business. Although at times he employed large numbers of workmen, his treatment of them was such that he never had the slightest controversy with them, but enjoyed their full confidence and he confided in them. While engaged as a contractor, he represented the sixth ward in councils and took an active interest in its deliberation. He never allied himself with any faction, but exercised his best judgment on all public questions. He was intensely interested in all matters pertaining to the welfare and prosperity of the community, and his influence was potent.

After retiring from the contracting business, he devoted some three years to extensive travel, visiting Europe and the continent, as well as the leading points of interest in this country. After returning home he became interested in a number of enterprises.

For many years he had been president of the Duquesne National Bank, and its success can be largely attributed to his personal influence. In the late seventies he became associated with his brother John in the Bindley Hardware Co. and had been its vice president since its incorporation in 1890. Upon the organization of the Pittsburg Steel Hoop Co. in 1899, Mr. Bindley became its president and later when the enterprise was merged into the Pittsburg Steel Co., he became vice president of the latter corporation and devoted considerable time to its affairs. It was his delight to meet the employes of the company, encourage them and scatter sunshine in their pathway. He took pride in the knowledge that his means assisted the employment of an army of men and that it contributed to the support of them and their families. He was a large stockholder in the Southern Steel Co., an active director and secretary of the Seamless Tube Co. and a director in the City Insurance Co. Mr. Bindley was also president of the Neely Nut & Bolt Co. Many years since he succeeded his father as a trustee of the Dollar Savings Bank and had been for some time a vice president of that institution.

In 1884 Mr. Bindley was married to Mary, daughter of the late John Musgrave, who survives him. He is survived also by two sisters, Mrs. Zabina Johnston and Mrs. Mary B. McMillan, and two brothers, John and Josiah Bindley of the Bindley Hardware Co.

The Elyria Iron & Steel Co., Elyria, O., is to erect an additional rolling mill which will practically double the capacity of its plant.

LESSENED DEMAND

AND LOWER PRICES ALARM BRITISH TRADE

New Orders Few Except in the Steel Industry.—Annual Reports.

(Special Correspondence.)

Birmingham, England, Feb. 28.—The iron trade is passing through a period of much anxiety, owing to a decided falling off in demand. With the exception of steel, hardly any orders are being placed at present. Although makers still have good reserves to work upon, this state of dullness cannot go on without a serious fall in values. So far, this has had no palpable effect on the prices of finished iron, but it is significant that the Unmarked Bar Association, which met in Birmingham on Thursday last, decided not to raise prices, which consequently remain at £7 5s per ton. A month ago, as I indicated at the time, no doubt whatever existed that the meeting which was to follow the wages declaration would see a rise of prices. Such rise at present would only excite ridicule. The check will have another effect in rendering more difficult the effort to arrange prices on a general basis as between the various districts, a movement which lately looked hopeful.

Stocks Accumulated.

The movement of weakness has had its origin in Cleveland, where the accumulation of stocks has been a constant source of uneasiness. Up to Thursday last the Cleveland fall, in a fortnight, totaled 6s. On that day there was a recovery of 9d, and since that time there have been fluctuations, but the market is still lifeless. This district usually disregards Cleveland, loftily treating it as having no influence on the market, but local makers are now actually undersold by that district, and there are now quotations, especially by Northamptonshire, from 3s to 4s below recent figures. Apparently, no business has been done at this, buyers looking for still lower prices. To a less extent, there has been a weakening of the finished iron market, but the utmost fall does not exceed half a crown a ton. Until orders are more urgently wanted, there will not be much giving way. The Galvanized Sheetmakers' Association at its meeting in London last week, decided to maintain present prices. There has been a slight falling off in demand, but not enough to cause concern.

Foundries Are Busy.

Steelmakers continue to have the pick of the basket in the matter of orders, and can still dominate the market. The foundries are also very comfortably off. Messrs. Kynoch's foundry, for example, is having a splendid run of work on steel anchors, which it makes its specialty. The firm has an excellent foundry, and cuts prices so fine that other firms in the district do not seem to get a look in. In view of the present boom in ship building, which shows no sign of falling off, this firm can look forward to activity for many months ahead.

Some of our largest companies have this week issued their reports. The Barrow Hematite Steel Co., of which the Duke of Devonshire is chairman, reports a profit a of £35,000, as compared with £10,000 in the previous year, and this is after deducting £17,000 for depreciation and improvements. The ordinary shareholders have had nothing since 1902, when they received 3 per cent, and they now get 1 per cent, the preference shareholders getting an extra ½ per cent. The directors state that prices for pig iron and ship building material improved from about September last, but have recently receded from the highest point reached. The Vickers, Maxim Co., whose armor plates are of world wide fame, expresses great satisfaction with the year just closed. Two years ago it declared a dividend of 10 per cent, which last year was raised to 12½ per cent, and it now proposes a further advance to 15 per cent. The amount carried forward is increased from £191,000 to £210,000.

Railway Prosperity.

A further evidence of the great prosperity of the railway rolling stock industry is the declaration by the Birmingham Railway Carriage & Wagon Co., Ltd., of a dividend of 10 per cent on the ordianary shares, with an additional bonus of 5 per cent, and payment of 6 per cent on the preference shares. It carries forward to reserve and depreciation £15,000. Messrs. Thomas Pickard and J. T. Collins were at the annual meeting reelected directors. Still stronger evidence in the same direction is the declaration of 10 per cent dividend by the North British Locomotive Co., an important combine of Glasgow engine builders formed in 1903, and which is capitalized to two millions. The preference shares of this concern are now quoted at 12½, and the ordinary shares at 18.

As I anticipated in my last letter, the rumor that Messrs. J. and S. Roberts, of the Swan Foundry, would recommence, has not been realized. No doubt, the obstacle to resuming operations is the want of capital. The whole of their loose plant, stock, tools and materials used in the pipe, roll-making and general engineering business, is to be sold on March 5, 6, 7, and 8. This looks like the final break-up of the concern.

American Competition.

The crushing defeat inflicted upon tariff reformers has by no means silenced prominent traders who feel the pinch of foreign tariff, and mean to make their grievances known. One of our largest makers of weighing machines is the firm of Messrs. Henry Pooley & Son, of Smethwick and Kidsgrove, and at their annual meeting in Birmingham yesterday, Sir J. Fortescue Flannery, the chairman, complained with some bitterness, that they had to compete every day with American goods here, while it was impossible to meet their competitors in America, owing to prohibitive tariffs. It should be added that notwithstanding this complaint, the firm expresses great satisfaction with its foreign trade, which is rapidly increasing, and though it is not able to pay a dividend on the ordinary shares out of the £9,000 profit, it is paying 1½ years' dividend on the 5½ per cent preference shares, and the concern is considered to be in a very sound and hopeful condition.

BUILDS FOREIGN PLANTS.

The annual report of the American Radiator Co. for the fiscal year ending Jan. 31, 1906, shows net earnings of $833,917, the largest in the history of the company. The financial statement follows: Net profits, $833,917; preferred dividends, $210,000; balance, $623,971; paid on common, $196,013; surplus, $427,904; per cent on common, 12.69.

Concerning the company's foreign business, President Clarence M. Woolley says: "The foreign business continues to grow. The desirability of manufacturing in the various countries abroad has been satisfactorily demonstrated. The plant which was built in Germany has proved a success and the plant in France continues to make progress. A large plant is being constructed in England, which will enable the London branch to supply more promptly the large volume of business which it has established in the British islands, the Netherlands, and Scandinavia.

"There still exists a prejudice in foreign countries against American methods of warming, but advancement is being realized as the result of persistent effort on the part of the comprehensive selling organization which operates in all the European countries, with connections in Africa, Australia, Egypt, India, China and Japan.

TARIFF REVISION

Entirely Ignored In Address of Canada's Governor-General, Outlining Important Measures.

(Special Correspondence.)

Toronto, Can., March 12.—It is now definitely settled that there will be no tariff revision during the present session of the Canadian parliament, which opened March 8. The governor general's speech from the throne, in which the more important measures to be dealt with were foreshadowed, entirely ignored the subject.

Dr. Eugene Haanel, Dominion superintendent of mines, has returned from Sault Ste. Marie to Ottawa, and will shortly issue a report giving full details of the experiments in electric smelting, which were concluded this week. He will confer with the government as to the advisability of undertaking further experiments along the same lines, as the appropriation made for the purpose has not been exhausted, and if the proposition is regarded favorably, will shortly return to the Sault, accompanied by Dr. Heroult, for that purpose.

The geographical survey branch of the interior department has issued a summary of the mineral production of Canada for 1905, the total value of which amounts to $68,574,707 as compared with $60,073,897 for 1904. The metallic output was $37,150,836, including 116,770 tons of iron ore for export, value $125,119. The total production of pig iron in Canada is given at 527,392 tons, value $6,492,992. Of this it is estimated that 70,554 tons, value $1,047,800 were produced from Canadian ore. Coal was produced to the amount of 8,775,933 tons, value $17,658,615, being over 25 per cent in value of the aggregate mineral production.

The annual report of the department of railways for the fiscal year ended June 30, 1905, gives the number of completed miles of railway in Canada at 20,601, an increase of 900 miles. There were also 3,632 miles of sidings. The gross earnings were $106,467,199, an increase of $6,247,763; working expenses, $79,977,574, an increase of $5,414,412, leaving net earnings amounting to $26,489,625, or an increase of $833,351. There were 793 miles of electric railways in operation, the net earnings of which were $3,438,931.

The strike of machinists employed by the Canada Foundry Co., which began May 1, has been officially called off by the Machinists' Union, and the Amalgamated Society of Engineers. The company has notified its employes that none of them will be displaced to make room for returning strikers. The cause of the strike was the introduction by the company of the individual contract system to which the unions objected, claming that all contracts should be made with the union.

The Atikokan Iron Co. has let contracts to the Stowe, Fuller Co., Cleveland, and the Reese Hammond Co., Bolivar, Penn., each for 700,000 fire brick to be delivered at Port Arthur, Ont., before June 1.

Lloyd-Thompson Wire, Ltd., has been incorporated, head office, Toronto; capital $75,000; provisional directors, Cyrus S. Lloyd, George C. Thompson and Wm. M. Smith.

BESSEMER STEEL IN GREAT BRITAIN.

Statistics of the Bessemer steel industry in Great Britain for 1905, as collected by the British Iron Trade Association, are published in the *Iron & Coal Trades Review*. The output of Bessemer steel ingots for the year amounted to 2,009,712 tons, which compares with 1,781,533 tons in 1904, and 1,910,108 tons in 1903. The increase in 1905 was 228,179 tons on 1904, and 99,694 tons on 1903. By districts the production was as follows:

District.	Tons.
South Wales	460,657
Cleveland	373,180
Sheffield and Leeds	368,405
West Cumberland and Lancashire	581,120
Scotland, Staffordshire, etc.	226,350
Totals	2,009,712

The output of acid steel ingots in 1905 was 11,493 tons less than that of 1904, while the output of basic steel was 239,672 tons more. The acid steel total tonnage for 1905 was 1,117,731 and the basic 891,981. The output of Bessemer steel rails was 951,552 tons, an increase of about 35,000 tons over 1904, but 110,000 tons less than in 1903. The 1905 tonnage of Bessemer steel bars was 288,980, of blooms and billets 286,082 and of general merchant steel 187,973.

The total number of Bessemer converters in operation throughout the United Kingdom in 1905 was 60, while 16 others were unemployed, as shown in the following statistics of Bessemer converters in 1905.

	Working	Idle	Total
South Wales	11	7	18
Sheffield	13	4	17
Cleveland	10	4	14
Cumberland	13	0	13
Lancashire	3	1	4
Scotland, etc.	10	0	10
Totals	60	16	76

Altogether there were 19 different works engaged in the manufacture of Bessemer steel in 1905. Of these, seven produced between 100,000 and 200,000 tons, while only one establishment produced over 200,000 tons.

INCREASED DEMAND

And Higher Prices for Standard Coke. —Probable Effect of a Strike.

Uniontown, Pa., March 10.—This week shows an increased demand and an increase in prices, in standard foundry coke. There is an underlying fear that there is going to be an anthracite strike. Several of the largest foundry customers have been ordering the maximum of their contract and storing the coke because of the danger of the anthracite matter not being amicably settled. The operators are asking fifteen to twenty-five cents per ton more for foundry coke this week than they did last week. Furnace coke is selling for ten cents a ton stronger. These remarks do not apply to second grade furnace coke produced in the south end of the field, known as the Southern Connellsville region. Quite a number of the foundry buyers are beginning to see that foundry coke is down to its normal basis and want to contract for the rest of the first half.

There is practically no standard foundry coke on the open market today. One consumer who attempted to buy some last week found that there was none to be had. Standard furnace coke today is worth $2.40 and $2.50 and the best coke has been bought up for the first half.

There is no fear whatever in this region that the strike will interfere with the labor at the mines in this vicinity as there is no organization of any consequence, but if a strike should come, it would certainly increase the prices of coke, owing to the fact that quite a few small furnaces in the east that are now using hard coal would be forced to use Connellsville coke.

The total production in the Upper Connellsville field is approximately 300,000 tons and in the Lower Connellsville or Klondike region 100,000 tons.

The Pennsylvania Railroad Co. has been experiencing a slight shortage in box cars but not enough to effect the prices to any great extent.

The Crouse-Tremaine Carbon Co., Fostoria, O., is preparing plans for a building 80 x 300 feet with iron roof, two other structures each 60 x 100 feet, one 60 x 80 and one 60 x 40 feet. All will be of structural steel with brick curtain walls.

PERSONALS.

Frank M. Peters has been elected a director of the American Radiator Co.

Joseph E. Gray succeeds the late John Stanton as president of the Wolverine, Mohawk and Michigan copper mining companies.

C. C. Boyden, who has been the New England representative of Matthew, Addy & Co., has taken charge of the New York office of that concern.

E. E. Ellis has become connected with the United States Steel Corporation, at Duluth, Minn., and has resigned his position with the United States Geological Survey.

William R. Fleming has resigned as president and general manager of the Harrisburg Foundry & Machine Works, Harrisburg, Pa., and has been succeeded by David Fleming.

Sumpter Lee Jr., superintendent of the Sloss-Sheffield Steel & Iron Co., at Coalsburg, Ala., has resigned and has opened an office in Birmingham, Ala., as civil and mining engineer.

Wm. H. Stubblebine, for 30 years superintendent of the merchant mill of Bethlehem Steel Co., has resigned, and has been appointed general manager of the Pittsburg Refined Iron & Steel Co., Pittsburg.

James S. Stirling, formerly president of the Crescent Shipyard, Elizabeth, N. J., has been made superintendent of the Hilles & Jones Co., Wilmington, Del., in place of Lawrence Jefferies, who has resigned.

Lewis D. Parker, formerly with the Hartford Rubber Works, has been elected president and treasurer of the Springfield Elevator & Pump Co., Springfield, Mass., of which he has purchased a controlling interest.

B. S. Bernstein, of the Rapid Steel Co., Manchester, Eng., was in Detroit during the past week on a business trip. He holds a secret process for making steel, which he states will admit of its sale at a largely reduced price.

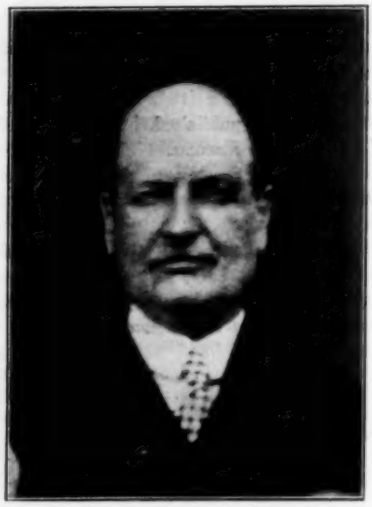
E. H. Pasmore has resigned from the management of the Detroit office of the Crucible Steel Company of America, to become manager of the Chicago sales department of the Columbia Tool Steel Co., of Chicago Heights, Ill.

S. De Long, secretary and treasurer of the Slatington Rolling Mill Co., Slatington, Pa., has been made general business manager in which connection he will transact the business formerly attended by Edward Edwards, president of the company, who died Feb. 21.

Albert H. Bates, of the firm of Thurston, Bates & Woodward, which recently dissolved, has retained the old offices at 1028 Society for Savings building, Cleveland, and has associated with himself Samuel E. Fouts and John B. Hall for the practice of patent law and the soliciting of patents.

J. D. Sawyer has been appointed manager of sales of the American Locomotive Co., reporting to R. J. Gross, second vice president in charge of the commercial department. W. E. Woodward has been appointed assistant mechanical engineer of the company at the Schenectady plant.

Robert W. Hunt, Chicago, has been chosen president of the American Institute of Mining Engineers, succeeding James Gayley. Theodore Dwight, for many years assistant secretary, has resigned to devote his attention to mining interests in Mexico. H. W. B. Howard, of Brooklyn, succeeds him. Dr. James Douglas, former president



THE LATE GEORGE K. HOSFORD.

of the Institute, has been elected an honorary member.

A. E. Hoermann, New York agent for the Curtis & Co. Mfg. Co., the Dayton Pneumatic Tool Co., and F. F. Slocomb & Co., is by reason of the extensive building operations about to begin along lower Broadway forced to leave the office at No. 261 Broadway which he has occupied only a short time. After March 15 he will occupy Rooms 1100 and 1101, No. 41 Park Row. In the new location he will also represent the Pilling Air Engine Co. of Detroit, Mich.

Control of the Dundee Silica Sand Co., located near Massillon, O., has been purchased by a syndicate of Ohio state officials. Don C. Cable of Nelsonville is president; W. S. McKinnon, vice president; H. S. McKinnon, secretary and general manager, with Wade H. Ellis and C. B. Ellis of Cincinnati as additional directors.

OBITUARY.

H. P. Mason, president of the Mason Hoge Co., and a widely known railroad contractor, died at his country home at Frankfort, Ky., March 8 after a brief illness.

Edwin Gilbert, Georgetown, Conn., president of the Gilbert & Bennett Mfg. Co., of that city, died Feb. 28, at Crescent City, Fla., at the age of 84. He was one of the best known manufacturers of wire goods in the country.

David Round, president of the Atlantic Foundry Co., Cleveland, died March 8 at his home in that city after several months' illness. He was born in Cradley, Staffordshire, Eng., in 1840, and 24 years later came to this country, locating at Troy, N. Y. In 1867 he went to Cleveland, where he established a chain making plant on a small scale and developed the business into the large industry of which he was the head at the time of his death.

John Pengilly of Northfield, Minn., formerly manager of the Chandler and Minnesota mines on the Vermilion Range and well-known in Lake Superior mining circles, died March 6 in Arizona of pneumonia. Captain Pengilly was a Cornishman and secured his early mining education in England, settling in the coal district when he removed to this country. Then he went to the Lake Superior district and in 1888 to the Vermilion Range where the remainder of his business career was spent. He retired about two years ago, but three weeks ago went to Cananea, Mex., to demonstrate the caving system for a mining company there. He was prominent in the Masonia fraternity and was a colonel on Gov. Van Sant's staff.

The Tariff on Patterns.—During the week representatives of the pattern makers' union made an appeal to the president, the treasury department and the attorney general in an effort to reverse the decision of the Circuit Court of Appeals in reference to the importation of patterns. Hoe & Co. imported a number of printing press patterns which were originally taxed 35 per cent on the ground that they were manufactures of wood. The company appealed and they were allowed to come in as models and were hence duty free. The pattern makers' committee contended that, if this ruling held and patterns were generally admitted without duty, it would be impossible for American laborers engaged in this business to continue. Pattern makers in England receive only about $10 per week, against an average wage of more than twice that amount in this country.

A Large German Foundry.

BY EMILE GUARINI.

In 1837, in Nürnberg, a merchant founded in that city, with the assistance of some English engineers, an establishment for the construction of machinery, which soon played an important part in connection with Bavarian industry, being favored by the rapid development of railways in that state. The enterprise was successfully carried on under the management of the founder's son-in-law, Mr. Cramer-Klett, who was later raised to the rank of baron, on account of the services he rendered to the trade and industry of the country. The firm was not able to escape the crisis which occured at the beginning of the second half of the last century, and which required all the development which electro-technical improvements have imparted to modern industry, to return to it the importance which it had early acquired.

The works of the Vereinigte Maschinenfabrik, Augsburg and Maschinenbaugesellschaft, Nürnberg, A. G., resulting from the establishment founded by Klett at Nürnberg became insufficient, and it was decided to transfer them to a place which offered more possibilities of extension.

A plot of ground was selected, comprising an area of about 89 acres, and located nearly a mile south of the city. The works alone occupy 66¼ acres, of which 19¾ acres are covered with buildings; eight acres are reserved for the business offices and the gardens adjoining them, while the remaining portions are occupied almost entirely by dwelling houses for the workmen.

INTERIOR OF FOUNDRY.

The entire area is traversed by numerous roads and paths, together with several standard gauge railway tracks, leading to the yards, work shops, etc., to facilitate the transportation of raw materials and finished products. Jib and traveling cranes, transfer tables and hoists of all types, both hand and electric driven, complete the transportation plant, which also includes steam locomotives and electric automobiles.

But little deviation has been made from the program originally adopted at the outset, by M. Rippel, the organizer of the transformation. In conformity with this program the local roads are so arranged as to divide the land into rectangular sections of 425 feet in length by 130 to 150 feet in width, roughly speaking.

The foundries, which may be considered one of the most important parts of the works, occupy two of the largest sections in the southeastern portions of the grounds. These two sections are located a short distance apart, and comprise the main foundry for iron castings, and the auxiliary foundry for brass and other metals.

Advantage was taken of the differences in level of the ground, in laying out the iron foundry. This facilitates and simplifies the handling of the coke and raw material. The latter, together with the fuel is discharged upon a level at the same height as the charging doors of the cupolas, i. e. above the floor of the foundry.

A new building was erected for the main iron foundry. The auxiliary foundry, however, has been established in

a building, which was already standing upon the land when acquired by the company. This building is divided into several rooms by means of internal walls. The foundry, proper, so called, communicates by means of these rooms with the depot for the raw material, and also with the department where the molds are made. It possesses several furnaces of average capacity, but much less than that of those in the large foundry.

Especial mention might be made of two furnaces of the crucible type, built by Baumann, the contents of which can, by means of a special arrangement, be discharged by causing the crucible to oscillate, without having to withdraw it and stop the operation. By means of these furnaces, ten castings may be made daily. The first furnace receives, at each charge, 330 pounds, and the second 660. In addition to these two furnaces, there are three of the ordinary type for melting readily fusible metals, and a cupola of rapid action for certain special pieces.

Products from these furnaces are sent to the finishing shop, where the castings are cleaned by the ordinary processes. Sand blast machinery is fitted up in this shop, together with the necessary tools and implements for cleaning. Such parts as require annealing also receive this treatment here.

The iron foundry is a building 334 feet long by 164 feet in width. This building is of the same light and sober construction as the others constituting the vast establishment of the Nürnberg company. All buildings are but one story in height, and are built of brick, concrete, etc., with relatively thin side walls, on account of the lightness of the roofs. Windows, with good clear glass, and sky lights provide an abundance of light during the day. Illumination is furnished at night by means of arc lamps.

In many foundries, the transportation of raw materials is effected in relatively small qualities upon trucks, or else upon a lift, by means of which they are conveyed to the charging platforms. In the present instance, the process is entirely different.

Depots are provided on a level with the charging doors of the cupolas, with which they are connected. These depots are partially roofed in, and are located at the rear of the foundry. A railroad embankment terminates at this place, and trucks loaded with material are run over this line, by means of a steam locomotive. These discharge their burdens at the top of the embankment. From the depots, the materials go to the bridge, and thence to the charging doors. A hydraulic disintegrator of high power is placed in front of the doors, and is used for crushing pig iron. Two fans are also provided, in order to supply the necessary draft for the cupolas. These apparatuses are driven by means of direct connected electric motors of the variable speed type. Either one of the fans will produce sufficient draft, the second one merely being kept as a reserve unit. Both fans discharge the air into a common conduit, from which there branch off pipes, leading to the various cupolas. Registers permit of the regulation of the draft, and the pressure of the air is constantly measured by means of small water manometers. There are five cupolas of varying capacities; one of 6,600 pounds, three of 11,000 pounds and one of 17,600 pounds, making a total hourly output of 57,200 pounds.

The cupolas generally are coupled, the mouths of each pair opening into a common dust chamber, into which the smoke is guided by partitions in such a way as to retain the dust and the flames before the gases escape into the common chimney. The ground, which is of the irisated marl type has been excavated to the depth of 6 to 9 feet, and the stone removed, has been replaced by molding sand. Two ditches or pits have been made to a depth of 13 feet, and with a diameter of 16½ feet.

The building contains a central bay 65½ feet in length and two bays each 49 feet in width. The central and one of the side bays form the large foundry, where heavy castings are made. At one end of the central bay are located the machines for cleaning the castings. These comprise, principally, a sand blast apparatus, and a large number of machine tools, operated by pneumatic power. Compressed air for these latter is furnished by a compressor located in a neighboring room, where there are also installed hydraulic pumps for use by some of the work shops using this form of motive power. The compressors are directly driven by means of electric motors. This shop also supplies compressed air to one or two of the machine shops.

At the opposite end of the central bay from that in which the heavy work is done, the lighter pieces are cast. In this portion of the building, also are prepared the sand and clay used in the molds. The hay and straw rope used in core making are prepared in this section by machinery, and plastic material for the molds is also mechanically kneaded up at this point.

Drying chambers are also provided, covering a total area of 3,275 square feet. These are served by means of railroad tracks, which terminate underneath the runways of the traveling cranes. The drying chambers are heated externally, and are fitted with sliding doors, so that they can be hermetically closed.

In the small foundry, hydraulic molding machines are installed for the manufacture of certain parts, such as those used in the construction of cars. Narrow gauge railway lines are placed before the cupolas, and in the small foundry, turn tables are provided to facilitate transportation. A dozen traveling cranes, operated either by hand or by electricity, in addition to four hand driven jib cranes, are also installed.

For each casting, tests are made, as regards tension and flexure, and samples taken from the mass are carefully analyzed. The castings are then sent to the shop, in which they are to be used. The principal of these latter are those for the construction of machinery, cars, roofs, bridges, etc. Other shops are those for pattern making, blacksmithing, etc. All of these are so disposed as to reduce, as far as possible, all necessity for transportation, so that each piece, during the course of manufacture, may pass on to each work shop in succession, without having to return to the preceding one. All the products are thus made to pursue a regular and logical cycle of quitting the condition of raw material. They are gradually drawn up to the finished state, and are ready for delivery as a complete unit, either for trade or industrial purposes.

Manganese Ores of Colorado.—The possible scarcity of manganese ores attracts attention to the manganiferous iron deposits of Colorado. It is reported from there that shipments to South Chicago of iron oxide ores running about 30 per cent manganese have been resumed. The local rival of the steel corporation is in the market for these ores, having offered to take 100,000 tons from one producer. A number of prospectors are staking out claims and doing sufficient work to give them the patent rights on this ore bearing property. Some local mines also produce iron very desirable for spiegel purposes their output being cleaner than imported ores and running very low in silica and phosphorus. A sample analysis would show: Iron 36 per cent, manganese 14.5 per cent, silica 3 per cent, phosphorus 0.015 per cent. Zinc sulphide ores which give prospect of being commercially available are also present in considerable quantities in the same localities.

MOLDING SAND.[1]

BY H. E. FIELD.[2]

A review of current literature on molding sand brings to my mind a previous experience some ten years ago. I then pursued a like line of research upon the subject of cast iron. The results were as follows: one authority stated that silicon softened cast iron, another that silicon hardened cast iron; one that sulphur was the most injurious element in cast iron, another that sulphur was never present in sufficient quantity to do any harm; one that phosphorus increased shrinkage, another that phosphorus decreased shrinkage; one that manganese hardened cast iron, another that manganese softened cast iron; one that cast iron gained in carbon in passing through a cupola and another that cast iron lost carbon in passing through a cupola. Since that time all of these apparent contradictions in regard to cast iron have been explained.

A similar contradiction exists in the literature in reference to molding sand. This is partly due to a confusion in terms and partly to the marked difference of opinion as to what constitutes a molding sand. I shall endeavor to explain away this confusion in terms but it is not practical to give definite specifications for molding sand on account of the great variety of work and the different methods of mixing sand for the same work. I wish to make it clear, therefore, at the beginning of this paper, that I am not attempting to lay down a set of standards for the chemical or mechanical analysis of sand. The day for that may come, and when it does the sand question will be much simplified.

The present knowledge of the simple principles which go to make up a good molding sand is rather vague and any attempt to build specifications upon it would be like building a house upon quicksand. We will study in as comprehensive a manner as possible, first, the composition, and second the properties of a molding sand. If we would improve molding sand or reduce its cost, we must have a thorough understanding of what would constitute a model molding sand. We can then intelligently select the materials which nature has placed at our disposal and combine them so as to approach a standard, for I doubt if there is a founder present who can say that he has even come near to perfection in quality and economy in the molding sand which he uses.

We are continually told that the good molding sand of the old days can no longer be obtained, and that the present supply is fast disappearing. If this is true it behooves us to gain a knowledge of what is necessary to make up a good molding sand, so that when nature's supply is exhausted we can prepare a satisfactory substitute from her abundant supply of constituent materials. Let us consider the composition of nature's molding sand with this in view.

Composition of Molding Sand.

Molding sand is made up of two distinct and necessary components: First—silica in the free state, and second—silicate of alumina. The free silica gives grain, refractoriness, porosity and low shrinkage to the sand, while the silicate of alumina furnishes bond. Free silica would be useless without the silicate of alumina, as it would not hold together. Silicate of alumina would be worthless without free silica, as it would not have sufficient porosity, and would have too great a shrinkage.

A confusion exists in the use of the word "silica" in respect to sand, which I shall endeavor to avoid by designating the silica existing in the free state "quartz silica." This quartz silica has a definite set of properties. It is hard, crystalline and very refractory, while silica combined with the alumina has lost all its original properties which are merged into the properties of the silicate of alumina. This last compound is very soft and amorphous, and its refractoriness depends upon its purity. The name silica has become so attached to the kind of sand known as "silica sand" that it is almost impossible to separate them in the minds of foundrymen. If I should state that a sand contained 80 per cent silica, I might convey the impression to some that 80 per cent was pure silica existing as quartz silica, while in reality a part of this 80 per cent would be united with the alumina. The same misunderstanding occurs from the use of the term "alumina." The alumina is confused with the silicate of alumina, or clay which makes up the bond. I might say that a sand contains 10 per cent alumina. I would not mean that there was ten per cent of bond and 90 per cent of refractory material, but that about twice this ten per cent, or the total silicate of alumina, would make up the bond. This silicate of alumina will be referred to as clay or bond in this paper.

There are several other substances present in all sand. These impurities are not at all desirable and are present from necessity rather than from choice. Quartz silica and clay in correct proportions can constitute a good molding sand without the presence of any other substance.

We will consider the individual characteristics of the constituents which make up a molding sand for the correct combination of these properties determines the quality and grade of the sand. A knowledge of the effect of the impurities allows us to determine to what extent they may be present in a given sand and still do no harm.

Ingredients of Molding Sand.

Quartz silica, clay, iron oxide, lime and feldspar are the principal ingredients of molding sand.

Quartz Silica.—Pure quartz, or silicon dioxide consists of 46.67 per cent silicon and 53.33 per cent oxygen. It is very hard, fuses at a high temperature, has no cleavage, and when pure is white. It is, however, generally colored by some oxide of iron. Its fusibility is affected by the amount of impurities present.

Quartz is the chief non-shrinkage element in molding sand. By this I mean that its size is not greatly affected by heating and cooling. It has however, no bonding properties. The shape of its particles affects the strength of the sand, but they have no strength in themselves, as quartz is absolutely non-plastic. The properties of a molding sand influenced by quartz silica are refractoriness, porosity and shrinkage. The size of the quartz grains determines the grade of the sand.

The percentage of quartz silica present varies in different grades of molding sand. The more refractory sands are generally higher in quartz silica, averaging from 60 to 70 per cent. (This must not be confused with the total silica.) The percentage best suited for a sand can only be determined by the kind of work for which it is used. The quartz silica should be kept as high as possible, on account of its heat resisting power, its tendency towards porosity and its low shrinkage.

Bond or Clay.—The bond of a molding sand is a clay product. Pure clay or kaolinite is a hydrated silicate of alumina; that is, a silicate of alumina containing water of combination. The exact composition of pure clay is silicon dioxide, or silica 46.4 per cent, alumina 39.7 per cent, water 13.9 per cent. It is this 13.9 per cent of combined water which gives the plastic properties to the clay. The part played by the water in adding plasticity is a matter for conjecture. This combined water is driven off at high temperatures and when it is thus driven off the bonding power of the clay is destroyed. The bond of a molding sand is not pure clay, but is generally mixed with impurities which weaken its binding power. Clay is formed by the decomposition of feldspars. These are rocks containing silicate of alumina together with silicates of the alkalies. After the rocks

[1] A paper read before the Pittsburg Foundrymen's Association March 5, 1906.

[2] Chief Chemist, Mackintosh-Hemphill & Co., Pittsburg.

are decomposed, more or less of the alkalies are washed out by nature's agencies, the amount remaining determining the purity of the clay, and hence its value as a refractory and bonding medium.

The clay acts as a binder for the sand and holds the refractory quartz silica together. The purity and plasticity of the clay determines the amount necessary to give a sand its correct bonding strength. The clay when pure is very refractory, and it is a fallacy to think that because there is a large proportion of bond in a sand that it is low in refractory qualities. A high percentage of clay in a sand destroys its porosity and causes high shrinkage and consequently cracks. The percentage of clay differs in different sands. A sand should be chosen with as low a clay content as is consistent with shop conditions. In foundries where a large percentage of old sand is used it is absolutely necessary to use a new sand containing a high percentage of bond. This is not conducive to the best results. There are, however, certain classes of work, the appearance of which must be sacrificed to cheapness of material, and such conditions require that a large amount of old sand be used in the facings. When a lower proportion of old sand is used, a new sand with less bond, and consequently higher quartz silica will give a more porous facing.

As previously indicated the percentage of clay should not be figured from the percentage of alumina present, as all sand contains feldspar which in turn contains alumina. This alumina in the feldspar has absolutely no bonding power.

Feldspar.—Feldspars are silicates of alumina combined with silicates of the alkalies. These are generally present in small amounts in molding sand, but they should be kept as low as possible on account of their fusibility as they tend to flux the rest of the sand and bind it together.

Oxide of Iron.—Oxide of iron is present in all molding sand giving it its reddish color. It may be united with the bond as an impurity, or it may form a part of the quartz silica. In either case it lowers the fusing point. The iron comes into the sand either from the original rocks from which the sand was formed or from water containing iron which has trickled through the sand.

Lime.—Lime is sometimes present in molding sand. It makes the sand fusible and liable to crack and crumble in the mold. It may come from the water which has aided in the decomposition of the rocks during the formation of the sand. The proportion and condition of the above products determines the quality of the molding sand, and vice versa, the properties of a molding sand are wholly dependent upon the percentage and condition of these products. We have noted in our remarks concerning silica and alumina that the ultimate chemical analysis and the properties of a molding sand do not necessarily correspond. Chemical analysis is, however, very useful in detecting injurious substances.

There is a method of analysis called "rational analysis" which has been used on clays and which gives a more correct idea of the constituents of a molding sand than does ultimate analysis. This separates the sand into three substances, quartz substance, clay substance and feldspar. I do not intend to go deeply into this phase of sand analysis, but rather to indicate it as a subject for further investigation which may prove very fruitful.

Analysis of Molding Sand.—The ultimate analysis of a good molding sand will give results within the following limits.

Total silica	75 to 85 per cent
Alumina	7 to 10 per cent
Lime below	2 per cent
Alkalies below	0.5 per cent
Oxide of iron below	6 per cent

The total percentage of iron oxide, lime and alkalies, or the total fluxing agencies should not ordinarily exceed 7 per cent in one sample. In a high grade molding sand used for heavy work they should not exceed 5 to 6 per cent.

A sand analyzed by the rational method should give a quartz silica of from 60 to 70 per cent, a clay content of from 20 to 30 per cent, with a feldspar below 10 per cent. If the iron was determined separately and subtracted from the clay content with which it is included by this method, we should have a fair indication of the properties of a molding sand as far as its refractoriness is concerned. The strength is so dependent upon the purity and condition of the clay that it cannot be accurately gauged by any analysis.

Two molding sands, one a so-called strong sand and the other a rather sharp sand, both of which would be classed as a No. 4, give the following results by ultimate and rational analysis.

SHARP MOLDING SAND.

Ultimate Analysis.

Silica	80.66
Alumina	9.30
Iron Oxide	4.53

Rational Analysis.

Quartz Silica	67.85
Clay content, including iron oxide	22.03
Clay content, excluding iron oxide	17.50
Feldspar	10.12

STRONG MOLDING SAND.

Ultimate Analysis.

Silica	77.22
Alumina	9.26
Iron Oxide	5.56

Rational Analysis.

Quartz Silica	64.66
Clay content, including iron oxide	28.06
Clay content, excluding iron oxide	24.50
Feldspar	7.28

Properties of a Molding Sand.

Sand can be used for making molds if it is refractory, porous, strong and of a correct grain.

Refractoriness.—The elements which determine the refractoriness of a molding sand are its silica or quartz contents and its clay or bond contents. As stated under "Compositon" the quartz when pure is very refractory, as is also the clay or bond content of a certain composition. It is, however, more difficult to obtain a sand with a bond of the correct composition than it is to obtain a sand containing silica which is comparatively pure. It follows therefore, that the higher the percentage of quartz a sand contains the greater will be its refractoriness. Consequently when a sand of high refractory qualities is desired, one should be chosen which contains as high a percentage of quartz silica as possible and still have sufficient bond to hold the sand together. Some sands high in clay contain a bond of sufficient purity to have a high fusing point. Such sands, however, are the exception.

The impurities which impregnate a molding sand greatly reduce its refractoriness. They may enter into the sand as an impurity associated with the quartz or the bond, and thus greatly reduce the refractoriness of these two principal ingredients, or they may enter in as an independent mineral substance which of itself fuses and holds the other constituents of the sand together. The sodium and potassium salts in the form of feldspars and mica are constituents of all clays to a greater or lesser extent, and consequently form a part of all molding sands. These alkalies, fusing at a low temperature may bind the rest of the substances into a hard mass. Iron oxide also increases the fusibility, as does lime which is occasionally present. This latter is most harmful when present as a carbonate, as a gas would be given off at a high heat which would prove detrimental to the mold.

The size of the grain of a sand may affect its refractoriness. Several experts on clays have demonstrated that under certain conditions the fusing point of the clay is determined by the size of the grain. It is therefore probable that the same holds good in regard to a molding sand, the larger grained sand having a higher fusing point.

The four principal factors pertaining to high refractoriness are: first, a high percentage of pure quartz silica; second, refractory form of clay bond; third, a freedom from harmful impurities; fourth, a comparatively large grain.

Porosity.—Some sands are naturally porous while others are very impervious to gas and moisture. The porosity of a sand determines the amount of venting necessary. Some sands must be vented very freely for all grades of work, while with others the use of a vent rod is hardly necessary. There are four factors which determine the porosity of the sand; first, the proportion of quartz silica to the bond; second, the size of the quartz silica particles; third, the shape of the quartz silica particles; fourth, the condition of the bond.

Proportion of Quartz Silica to Bond.—Generally speaking the higher the proportion of the quartz silica the greater will be the porosity of the sand. These particles are crystalline, ragged and irregular in shape and are in comparatively large grains, while the clay or bond is a very fine powder. It is plain, therefore, that inasmuch as the porosity of the sand is a very important feature, the percentage of the quartz particles should be kept as large as possible and still retain the other properties necessary to a molding sand. Quartz silica has no bonding power so there is a limit to the percentage which may be present.

Size of Quartz Silica Particles.—The larger the quartz particles the more porous will the sand be. It will be apparent, however, that the size is limited from the fact that a sand cannot be too coarse and still give a finish to the casting. The particles should, therefore, be kept as large as possible, and still produce the desired effect as to finish. There is another phase of this question which must be kept in mind, viz., that what appears to be a coarse sand may really be a mixture of fine and coarse. The fine particles mixed between the large ones and filling in the spaces will lower the porosity. A little thought will convince one that a sand containing comparatively fine particles of a uniform size will give a much more porous whole than will a mixture of coarse and fine grains. We have noted that the quartz grains should be kept as large as possible and still give a good surface to the casting. The converse is also true, viz., that the quartz particles should be kept as fine as possible and still give the required porosity. This latter condition is only found in sands with quartz particles of a fairly uniform size.

Shape of Quartz Silica Particles.—The porosity is also affected by the shape of the quartz silica particles. Irregular crystalline structures with sharp edges and corners will leave greater spaces between the particles than will regular particles with smooth surfaces which are apt to fit closely together and thus prevent a free passage of gas or air.

Condition of the Bond.—We have noted under refractoriness that the percentage of quartz silica should be as high as possible and still have sufficient bond for the work for which the sand is used. The amorphous condition of the bond or clay would tend to fill up the openings in the sand and reduce the porosity. The less the proportion of bond used, and still having sufficient binding power in the sand, the greater will be the porosity. It follows, therefore, that the stronger the bond, the less the quantity necessary to produce the same results, consequently the sand having the strongest bond requires the lowest percentage of bond. A low proportion of bond means a high percentage of quartz silica, and a high porosity. Consequently sands having strong bonding material rather than a large percentage of bond could be superior as far as porosity is concerned. It is this feature which more than any other distinguishes a good from a poor molding sand. There are certain molding sands found in nature which are what we would term sharp, and they still have sufficient bond for molding purposes. It is the strength of this small proportion of bond which permits of this being possible.

The tendency of clay to bake together and destroy the porosity of the sand and its tendency to crack, due to excessive shrinkage when drying render the presence of a large amount of clay bond objectionable. It is very necessary that a sand be chosen with a low percentage of strong bond rather than a large percentage of weak bond.

Strength.

The strength of a molding sand determines its adaptability for different kinds of work. Some castings may be made with sand having comparatively little strength, while for others a strong sand is absolutely necessary. The amount of strength necessary is somewhat dependent upon shop practice. The methods of molding, ramming, venting and mixing of the sand must all be considered in determining the proper strength of a sand for a given class of work. The practice of using flour, molasses or clay wash in mixing up facing, together with the proportion of coal dust and old sand used is also an important factor to be considered in the choice of a sand. In foundries where nailing is generally resorted to a weaker sand may be used than where nails are not used. A good mechanical mixer which intimately surrounds each particle of old sand with particles of new sand rather than putting the old and new sand together in chunks, also permits the use of a sharper sand. Where flour or molasses is used, or where the proportion of old sand to new sand is comparatively small, the use of a sharp sand is possible.

The strength of a sand depends upon three conditions; first the proportion of bond; second the strength of the bond; and third the shape of the quartz silica particles.

Strength of the Bond.—It follows other things being equal, that the greater the strength of the unit of the bond, the greater will be the stength of the sand. Under previous headings we have noted that the less the proportion of bond present in a given sand which still has the required strength, the better will be the other qualities of the sand. Consequently the stronger the bond the better the sand. There is but one argument in favor of a weaker bond used in larger proportions, viz: that it is much easier to distribute a large amount of bond over the whole, so that a sand with a larger percentage of a weak bond might be more uniform than a sand with a small percentage of strong bond. Uniformity is a very important property of molding sand. A good mechanical mixer however will generally do away with any lack of homogeneity.

Proportion of Bond.—Under porosity I have called attention to the difference in strength in the clay constituents. It follows that the strength of a sand will depend upon the amount of bond present if the strength of the bonds are equal.

Shape of the Quartz Silica Particles.—The shape and size of the quartz silica particles has an important bearing on the strength of a sand. Sands with quartz particles having a rough jagged exterior will be stronger than sands having smooth quartz particles. The rough surfaces would interlock in the first instance while in the second case the smooth sides would offer but little resistance to separation. The relative size of the quartz particles also affects the strength. The strength appears to be greater when there is a correct proportion of large and small particles. This condition exists when the particles are of such size and shape as to give a compact mass.

Size of Grain.—The grade of a molding sand is determined by its grain. The finer grained sands are used for the lighter work. Sands are graded and

sold by numbers based upon the size of the grain.

There are several factors which determine what grain of sand is most suitable for a given class of work. Some of these have been referred to under previous headings and need but a passing mention here. A sand should be as fine grained as possible and still satisfactorily fill the other requirements of a molding sand. This is due to the fact that the finer grained sand will give a better surface to the casting. The grain of the sand is determined largely by the grain of the original rock from which the sand was formed. The fineness of the sand is obtained quantitatively by the use of a series of sieves, 100, 80, 60, 40, and 20 mesh sieves being used. A weighed amount of the dried sand is placed in the 100 mesh sieve which is shaken for a definite time, say one minute. The siftings are carefully weighed and the weight recorded. The 80, 60, 40 and 20 mesh sieves are used in the same way. These separate weighings are multiplied by the number of the mesh of the sieve. There is a certain loss due to dust flying, etc., which is found by subtracting the total of the weights obtained from the original weight. This loss is multiplied by the average mesh of the sieves which is 60. The sum of the products of the weights obtained by the number of the sieves divided by 100 constitutes what is known as the "degree of fineness" of the sand. This method is unsatisfactory in many ways, as all sands of the same "degree of fineness" do not have the same physical effects when used as a molding sand. This is due to the fact that the proportion of sand which passes through each sieve has an important bearing upon the quality of the sand. We noted, under porosity, that a sand whose particles were all small but of uniform size would give better results than one with a combination of large and small grains which might be of the same "degree of fineness" when judged by the standard sieves.

It is never advisable to judge of the fineness of a sand by its appearance, for a comparatively few large particles will give the whole sand the appearance of being coarse while in reality it may be very fine when judged by the standard sieves.

In considering fineness we cannot lose sight of the other essential properties of sand. We have noted that of two sands of different size grains, the fine grained sand will fuse first; that a combination of large and small grains produced a sand of low porosity; that sands of equal sized grains gave a porous sand, and that sands with a correct proportion of large and small grains gave a strong sand. These facts oppose each other to a certain extent.

In selecting a sand for a given grade of work the sand should be kept as fine as possible and still be sufficiently porous and refractory. In order to be sufficiently porous and refractory and still be fine grained, the particles should be of as uniform a size as possible and still have sufficient strength.

Conclusion.

We have looked at molding sand from two view points. First as a study of the materials which go to make up a molding sand, and second as a study of the properties which are necessary and most desirable in a molding sand. A thorough understanding of the principles considered, should aid us in intelligently selecting the best sand for our individual use.

Let me remind you that what proves to be a good sand in one foundry may prove just the opposite under the differing conditions of another. It is with this fact strongly in mind that I give you general information rather than specific data which might apply to one set of conditions.

Under "Composition" I have classified the properties of the different ingredients of molding sand. Under "Properties of Molding Sand" I have endeavored to call attention to the different properties necessary to a molding sand, and have shown the possibilities as well as the limitations in choosing or making a sand for foundry use.

Judge Gary on Labor Unions.—On the subject of labor unions, Judge E. H. Gary, chairman of the directory board of the United States Steel Corporation, is quoted in a recent interview as follows: "I am of the opinion, and always have been, that labor unions, properly managed, are a benefit to the workingmen. No reasonable man would say otherwise, for co-operation and organization of the right sort can result in nothing but good to those concerned. But the trouble with labor unions has been that they have too often come under the control of men who did not hesitate to resort to turbulent methods to gain their ends. The majority of the men belonging to unions do not want to strike, and they do not vote to bring a strike about. Those at all familiar with the workings of labor organizations know how this is. The leaders gather a few of the more turbulent members around them and they do the voting. When the strike is declared the conservative men feel that it is their duty to the union to stand by what has been done, but they never resort to violence. Yet the effect of the strike is bad for the good men, and they are compelled to suffer for what the others have done."

FINANCING NEW PLANT.

Judge Gary Tells How Steel Corporation Will Raise Enlargement Funds.

Concerning the great steel plant which the United States Steel Corporation is planning for the south shore of Lake Michigan in Indiana just over the line from Chicago, Judge E. H. Gary, chairman of the board, has given out an interview discussing the financing of the enterprise.

"It has not been definitely decided as to the method of financing the Indiana plant," he states, "but in a general way the finance committee has considered the most equitable manner to pay for the new construction. In many corporations the plan of issuing bonds direct against the property to pay the entire cost would be adopted, but the Steel Corporation has decided to adopt a more conservative course. As our statements have shown, there has been set aside already $10,000,000 for the construction of this plant. As the work progresses, more funds will be required, and it is the consensus of opinion that it would not be the best interests of all concerned to pay for the entire cost of the new plant out of the earnings.

Most Modern in World.

"In the next five years we expect that there will be $75,000,000 spent on the new plant, which will be the most modern in the world. Our estimates are that the total annual output will be 1,750,000 tons of finished steel. At present the total output of the Steel Corporation of finished steel amounts to about 8,000,000 tons. It will be seen, therefore, the additional tonnage will add greatly to the total output of the corporation.

"The management is looking to the future, and to take care of the great and enlarging markets of the west, the construction of this plant was determined upon. There is little doubt that the entire cost, which, it is estimated, will be about $75,000,000, could be defrayed out of the earnings, as the expenses will be divided over a period of five years.

"I think, however, I am expressing the consensus of the board when I say that a bond issue will be determined upon, and that the proceeds of the bonds will go in part to pay for the new plant."

In reply to the question of just what the policy of the corporation is regarding the acquisition of additional plants and the control of mineral supplies, he said, "we are not seeking to acquire competitive plants and do not expect or desire a monopoly in our lines. We purchase good mineral properties whenever offered at a reasonable price."

NEW DEVELOPMENTS IN DRY BLAST.[1]

BY A. STEINBART.

Those who are connected with blast furnace plants have without doubt taken much interest recently in the old problem of removing the moisture from the blast, which has lately had a practical demonstration for the first time at the Isabella Furnaces of the Carnegie Steel Co. I say the old problem because to my knowledge, as far back as 1884 patents were applied for for a dry blast plant using refrigeration.

The moisture in the atmosphere which enters the blast is principally in the shape of aqueous vapor. It is on the average, higher in summer than in winter. In the month of July and August the moisture per cubic foot contained in the atmosphere varies from 4 to 9 grains, and in January and February from 1 to 6 grains. These changes from one extreme to the other, take place in a few hours sometimes, and cannot be predicted with better certainty than the weather.

In addition to the moisture, steam enters the blast from leaks in the engine house, and from the exhaust of engines, and steam formed by evaporation of water incident to the operation of the furnace, so that the blast frequently contains as much as 12 grains of moisture per cubic foot.

Upon coming in contact with the incandescent coke in the hearth of the furnace, the moisture is decomposed into oxygen and hydrogen, absorbing thereby 0.82 B. T. U. per grain of moisture decomposed. A sudden increase of moisture in the blast is always accompanied by a chilling of the hearth, an increase of sulphur and a decrease of silicon in the iron produced.

Considering the foregoing, it looks strange that there was not long ago an attempt made to desiccate the blast, but there was another way of looking at the problem.

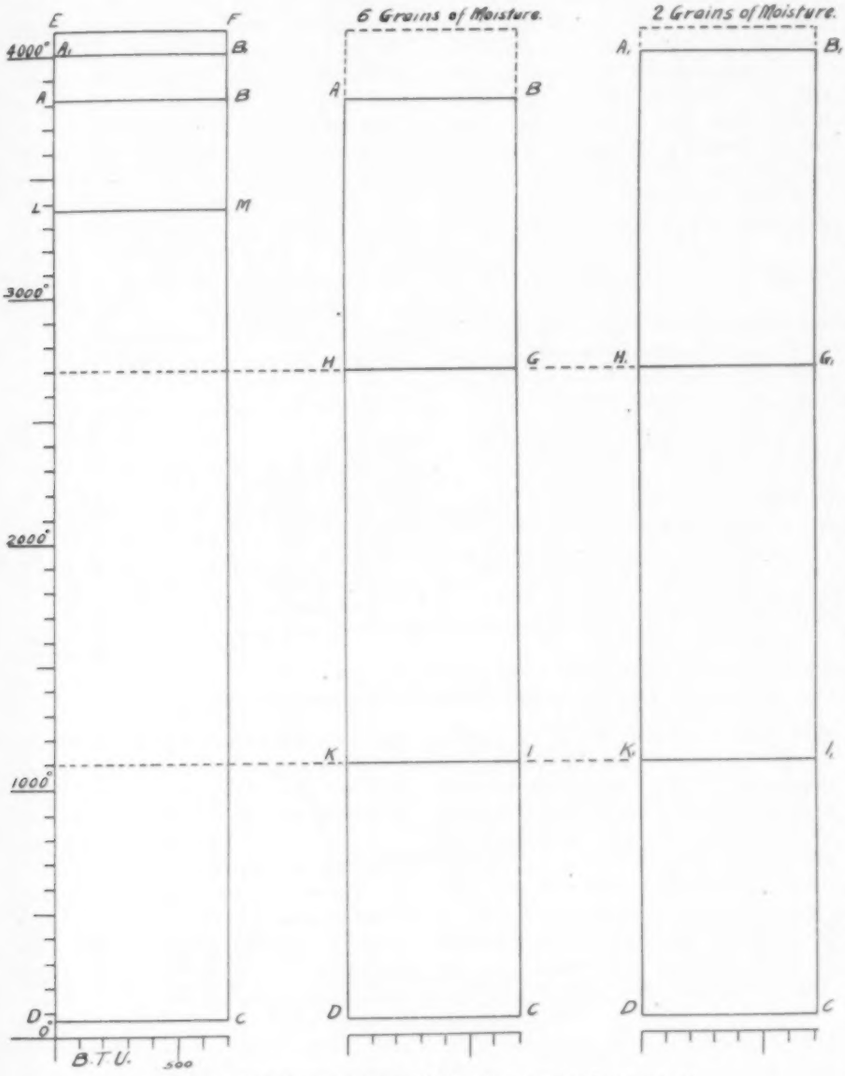


FIG 1.- GRAPHIC EXPLANATION OF JOHNSON'S THEORY.

Roughly speaking the moisture in the atmosphere amounts to five grains per cubic foot on an average over the whole year. There are about 60 cubic feet of wind used per pound of coke consumed in the furnace, so that 60 x 5, or 300 grains of moisture are blown into the furnace with the blast, per pound of coke consumed. One pound of coke, if burnt to CO_2, develops 12,600 B. T. U., and, if burnt to CO, it develops 3,800 B. T. U. 300 grains of moisture absorb 300 × 0.82 or 246 B. T. U. One-third of the coke is burnt in the furnace to CO_2 and two-thirds to CO; therefore one pound of coke develops

One-third × 12,600 + two-thirds × 3,800
= 4,200 + 2,530
= 6,730 B. T. U.

The saving in coke which could be effected by removing the moisture appears therefore to be 246 ÷ 6,730 = 3.7 per cent on the average for the whole year. If coke costs three dollars per ton and one ton of coke is used per ton of iron, ths would amount to 300 × 0.037 or 11.1 cents per ton which in view of the expensive and complicated plant necessary, hardly seemed a sufficient saving to warrant the experiment.

About 18 months ago, however, Mr. James Gayley published results which he had obtained by passing the blast of one of the Isabella furnaces, before it entered the blowing tubs, through a chamber which contained 90,000 feet of pipe maintained at a temperature below 32 degrees. The moisture in the blast was reduced to below two grains per cubic foot. A saving of nearly 20 per cent in coke was effected.

Everybody, even Mr. Gayley, was surprised at the results, and his claims were attacked as extravagant. Those of you who are interested can find a compilation of criticisms in *Stahl und Eisen*, in the December number of 1904 and the early numbers of 1905.

Mr. Gayley applied for a patent in which he claimed "The method of subjecting the ore with carbonaceous fuel to a blast of dried air, the burden of fuel being less than the normal burden by an amount materially greater than that which would be required to dissipate the eliminated moisture."

At the 88th meeting of the American Institute of Mining Engineers, Mr. J. E. Johnson explained the unexpected saving by pointing out that there is an amount of heat necessary in the melting zone for melting, etc., and that this amount of heat has to be furnished at a temperature above that at which the stock melts in the furnace. He called the melting temperature of the stock the "critical temperature," about 2,700

[1] Paper to be read before the Technische Verein, Pittsburg, March 15, 1906.

degrees. The amount of heat present above the "critical temperature" he called the "available heat." The available heat divided by the pounds of iron made gives the "available heat per pound of iron." The total available heat can be increased by removal of the moisture or by higher blast temperature and more iron can be melted with the same amount of coke gasified by the blast.

I will now explain Mr. Johnson's theory graphically, and give in addition my reasons why there is in a dry blast furnace less heat necessary, per pound iron made, for reactions taking place below the critical temperature. For otherwise the stock would enter into the hearth very soon so cold that the available heat would have to be used for heating the stock instead of for melting.

In Fig. 1, area A B C D represents the heat units generated in the hearth and introduced by the blast in one minute. The base of the rectangular area contains as many units of length as there are heat units required to heat the blast entering the furnace in one minute, through one degree; that is 710, so that the height of the area measured by the same units of length represents the temperature to which the blast is heated by the amount of heat repesented in the area. The area ABCD is composed of the heat generated by 40,000 cubic feet of blast in burning carbon to CO, i. e., 2,340,000 B. T. U. represented by area LMCD, plus the heat in the blast due to its temperature of 800 degrees (730 degrees above atmospheric temperature), i. e. 520,000 B. T. U., represented by the area EFML, minus the heat absorbed by the decomposition of six grains of moisture per cubic foot blast, i. e. 200,000 B. T. U. represented by the area EFBA, so that the total heat supplied to the furnace is 2,660,000 B. T. U. per minute, represented by area ABCD.

The available heat ABGH is 790,000 B. T. U. If 750 pounds of iron are made in one minute, one pound of iron requires, 790,000 ÷ 750 = 1,053 B. T. U. of "available heat" above 2,700 degrees.

If the moisture is decreased from six grains to two grains the total available heat is increased to 790,000+ (200,000 × 4-6) = 923,333 B. T. U., represented by area A_1 B_1 G_1 H_1, and with this heat there can be melted 923,333 ÷ 1,053 = 877 pounds of iron, an increase of 17 per cent, equivalent to a saving of 14½ per cent of coke gasified by the oxygen from the blast.

The heat of the gases traveling upward from the melting zone is used for heating the stock to the melting temperature, for decomposing the limestone into lime and carbon dioxide (which occurs at 1,600 degrees), for reducing the ore and for evaporating moisture in the stock and heating the same to the temperature at which the gases leave the furnace.

The reduction of iron oxides is effected in the blast furnace either by carbon:

$$Fe_2O_3 + 3\ C = Fe_2 + 3\ CO;$$

or by carbon monoxide:

$$Fe_2O_3 + 3\ CO = Fe_2 + 3\ CO_2.$$

The reduction through carbon commences slowly at about 800 degrees and progresses more and more rapidly as the temperature increases up to a white heat.

The reduction through carbon monoxide commences at a temperature of 500 degrees, and is most active around 1,000 degrees. At higher temperatures the affinity of the carbon monoxide for oxygen decreases gradually and is lessened by dilution of the carbon monoxide with the carbon dioxide formed by the reaction. At temperatures above 1,100 degrees for instance, gas containing more than three volumes of carbon dioxide to two volumes of carbon monoxide acts even oxidizing towards iron and the same is the case with only one volume of carbon dioxide to two volumes of carbon monoxide if the temperature is above 1,500 degrees. We may, therefore assume that the temperature of the gas must be lowered to nearly 1,100 degrees to allow reduction through carbon monoxide to such an extent that a large percentage of carbon monoxide is oxidized to carbon dioxide.

Reduction through carbon consumes heat, for one pound of oxygen separated from the iron and combined with carbon 4,300 B. T. U. are consumed in reducing Fe_2O_3 to Fe.

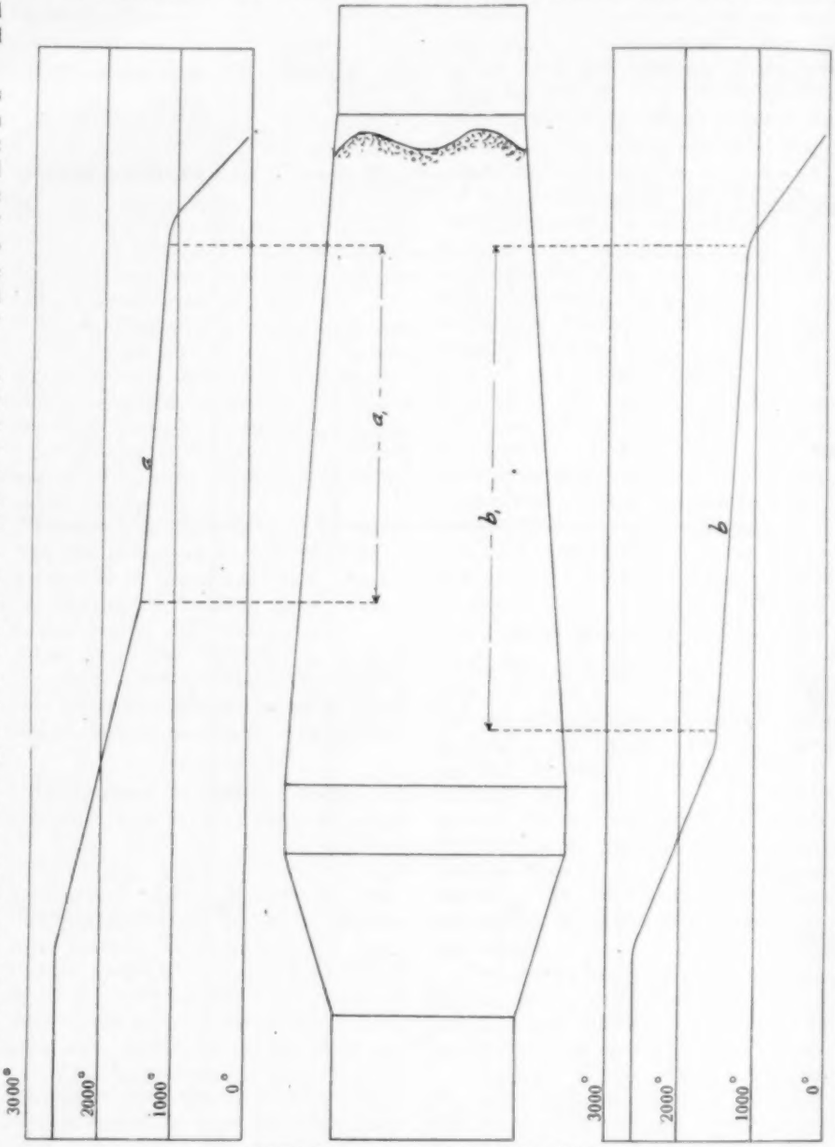


FIG. 2.—CURVES OF HEAT WITH WET AND DRY BLAST.
Curve *a*, wet blast; curve *b*, dry blast.

Reduction through carbon monoxide does not consume heat, for one pound of oxygen separated from the iron and combined with carbon monoxide no B. T. U. are consumed in reducing Fe_2O_3 to Fe.

It follows that all the heat rising from the melting zone available over 1,000 degrees which cannot be consumed by the heating of stock and decomposition of limestone must be spent in reduction of ore through carbon. The other part of the ore is reduced by carbon monoxide without drain on the quantity of heat emerging from the hearth. Equal amounts of heat H G I K and H_1 G_1 I_1 K_1, are left above 1,100 degrees after substracting the available heat from the total heat in the wet blast and in the dry blast furnace. There is however, more stock heated from 1,100 degrees to 2,700 degrees, and more limestone decomposed per minute in the dry blast furnace. A larger quantity of heat is, therefore, abstracted between 1,100 and 2,700 degrees, and in addition to a saving of 14½ per cent of coke gasified by blast, a saving of more than 14½ per cent of coke gasified by the oxygen of the ore is obtained.

But will this increase of reduction through CO occur to supplement lessened reduction through carbon? If it does not occur the quantity of unreduced oxides travels into a hotter zone where it is reduced by carbon and thereby cools this zone. This continues till the heat has receded sufficiently towards the hearth to give a longer zone for reduction through carbon monoxide. The sketch Fig. 2 illustrates this: Curve *a* shows the heat as it will likely be at the different levels in the furnace with wet blast and curve *b* with dry blast. The curves *a* and *b* indicate the respective lengths of the zone where reduction prevails through carbon monoxide. In this zone the stock remains practically at the same temperature for a long time in every case; but it remains for a longer time, if less iron is reduced by carbon.

As the saving of coke by diminished gasification of coke through blast is 14½ per cent and by diminished gasification through oxides is more than 14½ per cent for four grains of moisture, we must expect at least a saving of 3½ per cent for each grain of moisture removed from the blast per cubic foot.

Now you see that the removal of the moisture must effect a large saving in fuel in the furnace especially when we consider that we otherwise have to burden the furnace for the highest amount of moisture likely to occur in the season, though it may only last a few hours at one time. But this saving is at the expense of the calorific value of the blast furnace gas.

The heat energy brought into the furnace by the coke and blast cannot be destroyed and must appear therefore again in some form. At the wet blast as well as at the dry blast furnace it appears again in the following forms.

1. Heat in the iron; 2. Heat in the cinder; 3. Heat radiated from walls and given to the cooling water; 4. Heat which becomes latent by chemical reactions; for instance, heat absorbed by splitting of the ore into iron and oxygen, or heat absorbed by splitting limestone into lime and carbon dioxide; 5. Heat contained in the gas at high temperature; 6. Heat contained in the gas as combustible constituents; for instance, carbon monoxide, hydrogen and marsh gas.

Heat in iron and cinder will remain the same per ton of iron irrespective of the coke consumed and irrespective if dry or wet blast is used as long as the same kind of iron is produced: except that the quantity of heat in the cinder will be slightly increased by increase of cinder through ashes and flux of additional coke.

Heat loss through cooling water and radiation will be inversely proportional to the number of tons produced in a unit of time and will be a little smaller in the dry blast furnace, if the same has a higher production.

The heat which becomes latent through chemical reactions also remains substantially the same per ton iron. It will be slightly larger in the case of wet blast, as heat is used to split into carbon dioxide and lime 100 pounds of limestone for fluxing and 400 pounds additional coke per ton.

Therefore it is evident that a constant amount of heat is used for smelting the iron, itemized under heads 1 to 4 and that any surplus of heat going into the hearth by larger coke consumption appears again in the gas and can be utilized in the stoves and for generating steam.

At works where there is use for more steam than can be generated from blast furnace gas, the saving of 400 pounds of coke per ton of iron in the furnace is offset by an expenditure of 400 pounds of coal which has to be burnt under the boilers to furnish steam.

If the price of coke is $3.00 per ton and that of coal $2.00, 400 pounds of coke will cost 54 cents and 400 pounds of coal 36 cents, a difference of 18 cents per ton of iron. The cost of the dry-blast plant at Isabella Furnaces per ton of iron made is 14 cents so that we have a saving of only four cents per ton for blast furnaces and steel works as a whole.

The variable and high amount of moisture in the blast can be reduced however to a small and slowly varying amount by a method which I have devised and which only costs two cents per ton. The blast is cooled while under the pressure from the blowing engines by the bosh water.

The process is made possible by the fact that the moisture which may be contained in a space as vapor depends solely upon its temperature and not upon the presence or pressure of air in the space.

One cubic foot of space at 70 degrees for instance cannot contain more than eight grains of water vapor; one cubic foot at 50 degrees not more than four grains and one cubic foot at 32 degrees not more than two grains. If two cubic

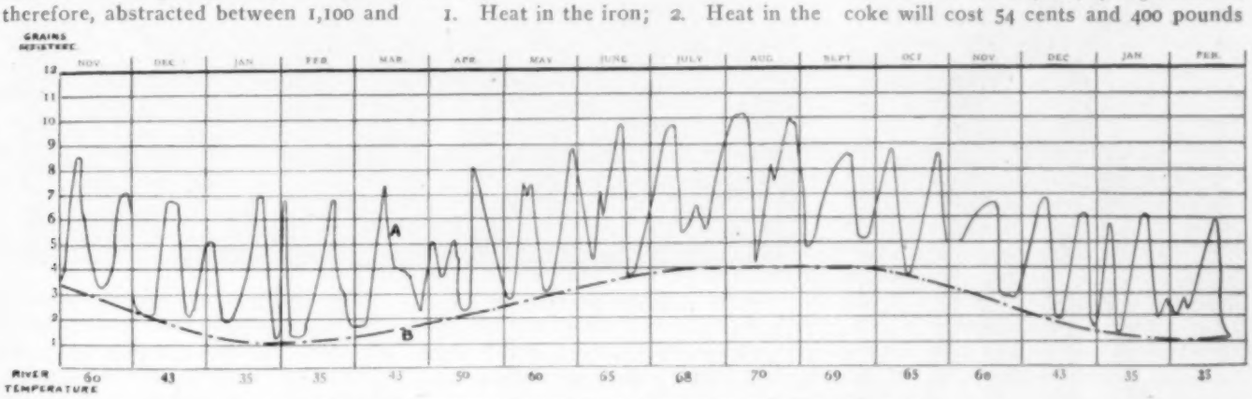


FIG 3—APPROXIMATE CONDITIONS IN MONONGAHELA VALLEY.
Curve A shows fluctuating moisture in blast at engine. Curve B shows steady moisture obtained by use of Monongahela water.

feet of air at 70 degrees containing eight grains each or a total of 16 grains are subjected to a pressure of 15 pounds per square inch, are compressed into the space of one cubic foot and the temperature is maintained at 70 degrees, eight grains must condense and can be removed. If the space is cooled to 50 degrees four more grains must condense and can be removed so that there are only four grains left in the original two cubic feet of air, or two grains in each.

The average pressure blown is 15 pounds. By cooling under 15 pounds blast pressure it is therefore possible to keep the moisture of the blast down to one half of what it would be if it was saturated at the temperature of the cooling water, and we may therefore employ water at natural temperature for cooling.

Monongahela river water has in summer a temperature of 70 degrees and in winter, of 35 degrees so that the moisture can be kept down in summer by its use to four grains and in winter to 1½ grains. The moisture will vary slowly between these two extremes as shown by curve B in Fig. 3.

The apparatus which I propose consists of a vertical cylindrical vessel of sheet iron, 60 feet high and 12 feet in diameter. It is closed at both ends and contains four horizontal tube sheets. The first and second, and the third and fourth tube sheets are 22 feet apart. The first tube sheet is connected with the bottom plate of the vessel by a central tube 3½ feet in diameter. The second tube sheet with the third in the same manner and also the fourth tube sheet with the top of the vessel. The first and last tubes are connected by six tee braces with the middle tube. The tube sheets are braced each with 12 I-beams.

A set of 1,000 boiler tubes, 2¼ inches diameter, connects the fourth and third tube sheets and a set of 1,000 boiler tubes of two inches diameter connect the second and first tube sheets. The tubes are 22½ feet long and project five inches below the lower tube sheet.

The blast from the blowing engines enters at the top above the fourth tube sheet, passes through the two sets of boiler tubes successively and then leaves the apparatus at the bottom for the stoves. The water enters the apparatus at the bottom, cools the outside of the boiler tubes traveling in the opposite direction to that of the blast. It leaves the apparatus at the dome at the top to go from there to the bosh of the furnace.

The tubes in each set are arranged in 12 sections and a tray is hung under each section. Into the bottom of each tray short nipples are rolled in such a way that a nipple projects four inches into each boiler tube. The nipples in the trays of the upper set of tubes are 1¾ inches diameter and those under the lower set of tubes are 1½ inches diameter. The moisture condenses on the inside of the tubes and runs down on the walls into the trays through the annular spaces between the nipples and the tubes.

Each tray is provided with an overflow tube which leads off the water of condensation. The water in the tray seals the annular space between the nipple and the tube so that the blast is forced to pass through the nipple without interfering with the collection of the condensed moisture.

The apparatus can be easily cleaned by washing out with a hose at times when the moisture in the atmosphere is low and no reserve is required. The boiler tubes can be removed after removing the plates in the top wall. The lower tubes can be passed through the upper ones.

The first cost of the apparatus for a 400-ton furnace is near $20,000; the cost of maintenance is low because there are no moving parts. The cost of operating is almost nil, as no attendance and no power is required.

In conclusion I come back once more to Fig. 3; curve A shows you to what degree the moisture varies in the different seasons. The temperature of the river water is given for each month at the bottom. Curve B shows how low and how regular the moisture may be kept by this simple apparatus, with natural water.

COAL STRIKE.

Discussed by Philadelphia Foundrymen—Will Visit Pittsburg.

The threatened coal strike and the advisability of stocking up with fuel and metal were discussed by the Philadelphia Foundrymen's Association at its monthly meeting on March 7, without any very definite conclusion being reached. In answer to requests for the views of members by Vice President E. E. Brown, who presided, J. H. Haldeman said that he would not be surprised by a strike. Mitchell he thought, did not want a strike, and the United States Steel Corporation was also opposed to anything that might interfere with carrying out its contracts, but in the west the feeling appeared to be against any advance in wages, and that might cause trouble. On the whole he thought it would be advisable for foundrymen, in view of the general uncertainty, to lay in some extra coal and metal, if they had important orders on hand to be filled.

"We must wait and see," said George C. Davies, of Pilling & Crane, "and we may have to wait until April 1 before anything definite can be known." He had seen letters from operators saying that a strike was likely, and he thought it probable there might be trouble in Indiana and Illinois, but not in western Pennsylvania. Furnace men were divided on the subject. Mr. Davies emphasized the point that all opinions were mere guess work, and that nobody really had any definite knowledge on the subject. Still, as a matter of business prudence he thought it might be well to lay in a little more fuel and metal than usual.

William Hanson thought, from what he had heard said by operators, that a strike was likely, while J. G. Bickley frankly admitted that he knew nothing about the matter. The only thing to be done was to wait and watch developments. He did not believe that much coal was being stocked up.

This discussion, which failed to throw much light on the situation, was followed by a talk on "Thermit Heating and Welding Compound," by E. Stutz, vice president of the Goldschmidt Thermit Co. The talk, which was illustrated by lantern slides, explained the use of thermit in welding fractures in locomotive frames, driving wheel spokes, pipes, cast iron, and the stern posts of vessels, and also its use in welding the steel rails of trolley lines.

Secretary Howard Evans announced that an invitation had been received from the Pittsburg Foundrymen's Association, to visit that city on April 2, inspect some of the large industrial plants at Homestead and other places, and be the guests of the local foundrymen at dinner in the evening. The invitation was accepted and a committee was appointed, consisting of Dr. E. E. Brown, Secretary Evans, George C. Davis, W. O. Steele, William Hansen, G. Krug, J. H. Haldeman, Thomas Devlin, H. O. Evans and George C. Davies to arrange for the trip and secure the attendance of as many members as possible. Promises to go were secured from a number of those at the meeting. It is proposed to leave Philadelphia on the evening of April 1, and after spending the day in Pittsburg to return home late Monday night, after the dinner, arriving home Tuesday morning.

At the Buckeye Engine Works, Salem, O., there is installed an electric magnet which will unload a carload of pig iron in three hours with only one man in the crane. Bins have been arranged for receiving the iron so as to prevent having to make even piles. When unloading the metal by hand it took six men six hours to unload a car.

THE GARDNER DISC GRINDER.

The accompanying illustration shows some work done on a Gardner disc grinder, built by the Gardner Machine Co., Beloit, Wis. The machine used was of the No. 4 type, which uses a 20-inch wheel. The rocker shaft of this machine is made extra long to accommodate a lever feed table, and also to allow the use of solid cup wheels, or solid or sectional cylinders held in a chuck. The end thrusts in both directions are taken in the right hand box on hardened steel collars, 4 inches in diameter. These collars run on cast iron plugged with babbitt.

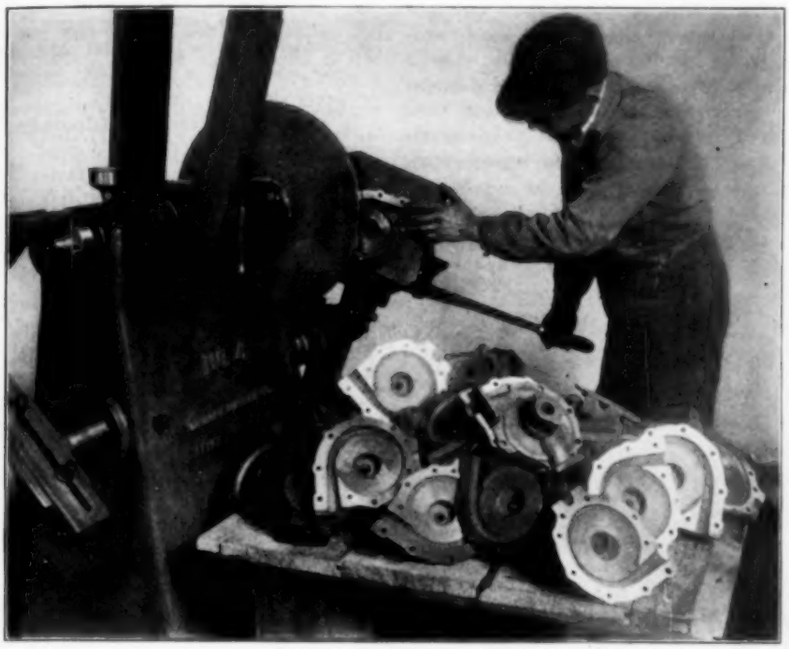


FIG. 1.—GRINDING PUMP CASES ON GARDNER DISC GRINDER.

The machine requires a floor space of 5 x 8 feet, and runs at 540 revolutions per minute.

The lever feed table, which is shown in Fig. 2, is made either right or left hand, and can be used on either or both ends of the grinder, instead of the regular table. Any allowable pressure against the wheels may be obtained by means of it, on all classes and sizes of work. The table swings on a rocker shaft across the face of the wheel. The top of the table is 9 inches wide and 14 inches long, and is mounted on a gibbed slide, which is protected from dust by sheet metal shields, fastened to the under side. The top is provided with T-slots for ½-inch bolts, and by means of these slots, holders for all kinds of work can be secured to the table in any position desired. Graduations on the segment allow the top to set at any angle between the horizontal and 45 degrees. The movement is governed by a finely threaded stop screw at the back. The table is provided with an adjustable counterweight, allowing a correct balance to be maintained.

The work done was the grinding of centrifugal circulating pump cases for one of the largest manufacturers of gas engines in the country. A lever feed table was used in connection with the angle plate faced with a hard wood block, which was cut out to receive the cases and allow them to bear on the heads of three wood-screws spaced equidistant on the flange of the cases.

The total number of pieces ground was forty-eight, and the time occupied was one hour and thirty-six minutes. This was at the rate of thirty pieces per hour. The rate of grinding on another type of disc grinder with a solid emery wheel was six per hour. The area of the surface on each piece was 15 square inches, and the thickness of metal removed varied from 1-64 to 3-32 inch, the average thickness being 1-32 inch. Some castings were so much warped that 3-32 inch had to be ground off in places to bring them flat. Castings that were nearly straight were finished in less than one minute. The disc used was a Gardner improved No. 16 adamite, which was not worn, and could have ground from 62 to 100 of these cases.

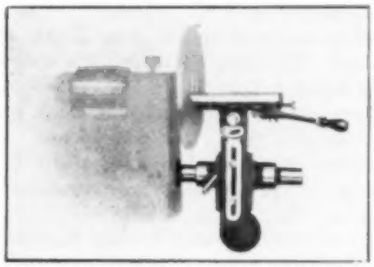
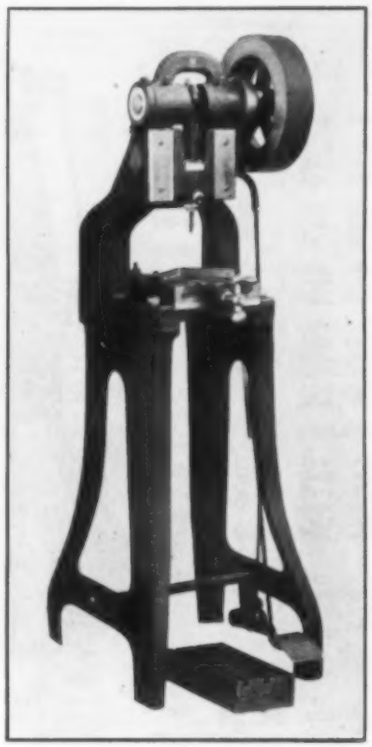


FIG. 2.—LEVER FEED TABLE FOR GARDNER DISC GRINDER.

BARNES KEY-SEATING MACHINE.

The accompanying illustration shows a key-seating machine originally designed by the B. F. Barnes Co., Rockford, Ill., for use in its own shop. Such good results were obtained from it that it was placed on the market.

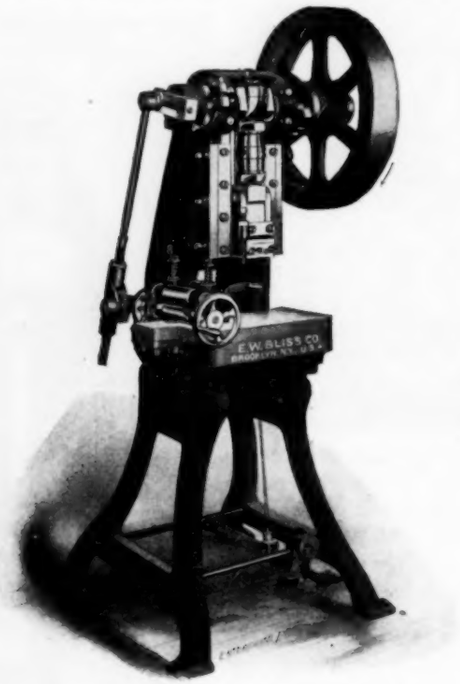
The machine is designed for light work in shops which have internal key-seating to do. The capacity of the machine is key-ways from ⅛ to ⅜ inches wide. The sliding table is operated by a ball handle and screw, and has three ½-inch T slots. It is furnished with or without a chuck for holding the work as desired. It can be furnished with or without pedestal legs, its height over all, in the former case being 63½ inches, and in the latter case 28 inches. The length of stroke of the tool is 1½ inches. The sliding table is 5¾ x 11¾ inches, and has a longitudinal movement of 2½ inches. The bench style of machine requires a space of 15½ x 15¼ inches, while the floor space requires 21 x 24 inches. The two styles weigh, respectively, about 400 and 575 pounds.



BARNES KEY-SEATING MACHINE.

A BLISS PRESS WITH SPECIAL SINGLE ROLL FEED.

There are three common types of roll feed, the first being a friction disc, in which a pawl operates on the edge of a toothless disc, taking its bite by means of a wedge action, which permits of easy adjustment and fine spacing. This feed is largely used for clock and watch parts and similar articles. The second type of feed is driven by a pawl and ratchet. This type is, perhaps, the most widely known and used. Among its limitations, is its inability to feed beyond ⅝ of the diameter of the roll, the variations being from zero to a maximum by a division in proportion to the number of teeth cut in the ratchet wheel. A fine adjustment of feed necessitates a wheel with fine teeth or with three or four pawls, and to feed any great length makes it necessary to have the rolls of comparatively large diameters, or else, to back gear them.



BLISS PRESS WITH ROLL FEED.

The E. W. Bliss Co., 8 Adams street, Brooklyn, New York, has designed a rack roll feed, which is shown on the press in the accompanying illustration. This feed is stated to overcome the objections of the pawl and ratchet type. In construction, it is simple, and the method of operation is clearly shown in the illustration. The feed rolls are driven by a rack, which is part of the connecting rod, and which is adjustable in a crank block on the shaft, by means of a set screw. The greater the distance of the connecting nut from the shaft center, the greater is the travel of the feed. This distance can be varied so as to take in practically anything desired. A very fine feed can be made, or with further adjustment feed to take in the largest kind of work without materially increasing the size of the rolls. If the nature of the work demands, it is possible to build a double roll feed of the same general construction.

THINKS ESTIMATE IS LOW.

James M. Swank of the American Iron & Steel Association takes issue with the estimate placed by consul-general Mason of Paris on the deposits of iron ore in the United States. Mr. Mason figures that the ore available all over the world is about 10,000,000,000 tons, and predicts that the supply will run short inside a century. The United States deposits, he declares, are being consumed at a terrific rate which will soon exhaust our deposits which he estimates at 1,000,000,000 tons. Concerning these totals, Mr. Swank is quoted as follows: "They are far below the known workable deposits, including those in the Lake Superior region, Alabama, Utah, Alaska, and other sections of the country which have only been partly developed, if developed at all, while the possibilities of further discoveries on our own soil of extensive deposits, which are confidently relied upon by experts, are ignored entirely. The vast deposits of Cuban iron ore which are owned by American capitalists, and the nearness of extensive iron ore deposits in Canada and Mexico, yet to be developed, but known to exist, are entirely lost sight of."

STEEL CARS FOR THE R. P. O.

Since 1900 seventy postal clerks, substitutes and weighers have been killed in railroad wrecks while on duty, 444 have been injured seriously and 1,663 have been hurt slightly. The clerks in the railway post office service are among the most expert employes of the Government, and the department is seeking continually to improve the conditions under which they work, lessen the dangers that surround them and protect their lives and the valuable property in their care.

In 1893 the Government adopted specifications for the construction of mail cars requiring them to be heavier and more substantial than those then in use. In May, 1904, these specifications were revised and further strengthening of the cars was required. The railroad companies have also been experimenting with improved rolling stock, the Erie building an all steel car and the New York, New Haven and Hartford two; the Pennsylvania road is drafting plans for an all steel car, and the Santa Fe company has contracted for thirty-nine steel sheathed cars, with under frames and flooring of steel, the floors to be finished with cement, felt and wood. All these cars are much heavier than those previously in use. Under the Department specifications of 1904 a full sixty-foot car weighs 100,000 pounds, or 20,000 pounds more than one built on the plans adopted in 1893. The clerks prefer the larger, heavier cars, which they believe to be safer in accidents than the others. Yet in a wreck on a Texas railway a fifty-foot car telescoped a sixty-foot car of later build and much greater weight and was itself practically undamaged.

None of the steel cars now in use has been in an accident. The postal clerks have great faith in them, feeling that they are practically indestructible and almost sure to preserve the lives of all who are in them. It is likely that steel mail cars will some day be required by the Government, and when they are it is not improbable that the public will demand a substitution of metal cars, or cars so heavily re-enforced with steel as to be practically the same thing, for all wooden passenger coaches.—*New York Sun.*

Consul-General Rodgers of Shanghai, China, writes that in the great Yangtse valley agricultural machinery is not used, even the plow being a rarity. The Chinese turn over the ground occasionally with their mattocks, it is harrowed in a primitive way and when the crop is gathered hand labor does all the work.

Stocks Advance Toward Close of Week.

Unsettled trading marked the early days of the past week on the stock exchanges, with depressing rumors plentiful and sharp breaks resulting. Conditions were generally improved on Thursday, however, and for the remainder of the week the market was strong and active, with transactions of fairly good volume and closing prices in most instances advanced. The week saw the end of the long period of downward tendency and the culmination of the liquidating movement which had been dominant since the third week in January. At that time the average of prices was the highest of the year; liquidation hammered them down about ten per cent. With the close of this movement came a strengthening feature in the improved money conditions. Although New York was but little benefited by its share of the $10,000,000 distributed by Secretary Shaw, the foreign situation became notably easier and arrangements for importations of gold were reported. Rumors of the severe illness of Charles M. Schwab, which were practically without foundation, and even of his death in the west, had a temporary depressing influence on the market and caused a sharp break in the securities of Tonopah Extension, Bethlehem Steel and other enterprises in which he is heavily interested. Those industries which would be most severely crippled by a general coal strike were comparatively quiet, as the conference of anthracite operators at New York had no definite results, and the prospects for peace were not improved during the week. The copper stocks continued to hold the center of attention, Amalgamated Copper, American Smelting and Anaconda totaling sales of 1,500,000 shares. Reading and Union Pacific were both heavily dealt in. In the iron, steel and manufacturing group, United States Steel common sold 478,600 shares, the preferred 140,000 shares, Colorado Fuel & Iron 240,000 shares and American Locomotive 80,000 shares.

FINANCIAL NOTES.

Net earnings of the American Car & Foundry Co., for the third quarter ending Jan. 31, were $1,008,110, against $717,739 for the previous quarter and $625,311 for the first quarter of the fiscal year, making a total of $2,351,160 for the three quarters.

The Hudson Iron Co. has filed a mortgage to the Knickerbocker Trust Co., of New York, to secure an issue of $1,000,000 five per cent 25-year bonds. The mortgage covers the company's properties in Secaucus, N. J., and in Orange county, New York.

The annual statement of the Nova Scotia Steel & Coal Co. for the year ending Dec. 30, 1905, shows the profits of the past year as $559,906, comparing with $501,337, an increase for the year ending Dec. 30, of $58,569. The increase in business over the previous year was $597,887. The repot concludes that the directors consider it unwise to declare dividends on the common stock at present.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. March 10	Closing Quotation March 3	Changes	Date of 1906 Ann. Meet.	Par Value	Capital Outstanding	Dividend Basis	Dividend Being Paid	Date Last Div. Dec.
Allis-Chalmers Co	20⅝	22	+1⅝	Sept.	100	19,820,000	7 cum	.....	....
Allis-Chalmers preferred	56	59	+3		100	16,150,000		.....	Feb., 1904
American Can	9¼	9⅞	+ ⅜	Apr. 24	100	41,233,300	7 cum	.....	....
American Can preferred	67⅜	68	+ ¾		100	41,233,300		5 Q.	Apr., 1906
American Car and Foundry	40¾	41⅞	+1⅛	June 28	100	30,000,000	7 n. c.	.....	May, 1905
American Car and Foundry preferred	101½	101¼	− ¼		100	30,000,000		7 Q.	Jan., 1906
American Locomotive	68⅝	70½	+1⅞	Oct. 16	100	25,000,000	7 cum	.....	
American Locomotive preferred	116	116	.....		100	24,100,000	4	7 Q.	Jan., 1906
American Shipbuilding	55	55⅝	+ ⅝	Oct. 2	100	7,600,000	7 n. c.	4 Q.	Dec., 1905
American Shipbuilding preferred	108	107	−1		100	7,900,000		7 Q.	Jan., 1906
American Steel Foundries	11⅝	12⅜	+1	Oct. 3	100	17,700,000	6 cum	.....	
American Steel Foundries preferred	43	48	+5		100	17,700,000		.....	Aug., 1905
Barney & Smith	25	25	.....	June 5	100	1,000,000	8 cum	.....	June, 1894
Barney & Smith preferred	120	125	+5		100	2,500,000		8 Q.	Mch., 1906
Bethlehem Steel	30	29	−1	April 3	100	15,000,000	7 n. c.	.....	
Bethlehem Steel preferred	89	88¼	− ¾		100	15,000,000	6	7 Q.	Feb., 1906
Bullock Electric preferred	114	114	.....	Oct. 2	100	1,000,000	6	6 Q.	Jan., 1906
Cambria Steel	35⅛	35½	+⅜	March 20	50	45,000,000	4	3 S. A.	Feb., 1906
Cambria Iron	50¾	50	− ¾		50	8,468,000	7	4 S. A.	Apr., 1906
Colorado Fuel & Iron	61½	65⅜	+3⅞	Oct. 15	100	30,132,000	5	.....	Apr., 1902
Wm. Cramp & Sons Ship & Eng. Bldg. Co.	20	24	+4	May 31	100	6,098,000		.....	Nov., 1902
Crucible Steel	14¾	15⅜	+ ⅝	Oct. 17	100	25,000,000	7 cum	.....	
Crucible Steel preferred	77½	79⅞	+2⅜		100	25,000,000		.....	Sept. 1903
Empire Steel	7⅝	7¾	+ ⅛	Feb. 28	100	2,281,400	6 cum	.....	
Empire Steel preferred	37	37	.....		100	2,500,000	5	3 S. A.	Jan., 1905
Fay & Egan	95	93½	−1½	Feb. 20	100	1,000,000	7 cum	5 Q.	Nov., 1905
Fay & Egan preferred	120	128½	+8½		100	1,000,000	8	7 Q.	Nov., 1905
General Electric	167¼	170¼	+3	May 8	100	48,256,050		8 Q.	Jan., 1906
International Pump	30	31	+1	June 5	100	12,262,500	6 cum	2	July, 1905
International Pump preferred	81¾	81	− ¾		100	8,850,000		6 Q.	Feb., 1906
Lackawanna Steel	75	75	.....	March 14	100	34,971,400		.....	
Lake Superior Corporation	20	20	.....	Oct. 3	100	40,000,000	6	.....	
Niles-Bement-Pond	119	124¼	+5¼	Feb. 7	100	5,000,000	6 cum	6 Q.	Feb., 1905
Niles-Bement-Pond preferred	106	105	−1		100	2,000,000		6 Q.	Mch., 1906
Otis Elevator Co	59	59	.....	March 19	100	6,350,300	6 n. c.	2 A.	Apr., 1906
Otis Elevator Co. preferred	103	103	.....		100	5,589,500		6 Q.	Jan., 1906
Pittsburg Coal Co	15½	15	− ½	Feb. 12	100	30,135,000	7	.....	
Pittsburg Coal preferred	56	57	+1		100	30,716,200		.....	Apr., 1905
Pressed Steel Car	52¾	53¾	+1	Feb. 21	100	12,500,000	7 n. c.	3	Aug., 1904
Pressed Steel Car preferred	97½	98½	+1		100	12,500,000		7 Q.	Feb., 1906
Pullman Palace Car	240	236½	−3½	Oct. 18	100	74,000,000		8 Q.	Feb., 1906
Railway Steel Spring	56½	57½	+1	March 1	100	13,500,000	7 cum	4 S. A.	Oct., 1905
Railway Steel Spring preferred	105	105	.....		100	13,500,000		7 Q.	Apr., 1905
Republic Iron & Steel	29	31	+2	Oct. 17	100	27,352,000	7 cum	.....	
Republic Iron & Steel preferred	102	105	+3		100	20,852,000	5	7 Q.	Apr., 1906
Sloss-Sheffield	79¼	81	+2½	March 14	100	7,500,000	7 n. c.	5	Jan., 1906
Sloss-Sheffield preferred	108	108	.....		100	6,700,000		7 Q.	Jan., 1906
Tennessee Coal & Iron	149¼	152	+2¾	May 15	100	22,552,800		4 Q.	Jan., 1906
U. S. Cast Iron Pipe & Foundry	46	46¾	+ ¾	June 27	100	12,500,000	7 n. c.	2	Jan., 1906
U. S. Cast Iron Pipe & Foundry preferred	92	92	.....		100	12,500,000		7	Feb., 1906
U. S. Steel	40¾	41¼	+ ½	April 16	100	508,302,500	7 cum	.....	Dec., 1903
U. S. Steel preferred	106	106¾	+ ¾		100	360,281,100	5	7 Q.	Feb., 1905
U. S. Steel 5's	98⅝	98⅛	− ½		100	463,798,000		5 A.	
Virginia Iron, Coal & Coke	45½	48	+2½	Sept. 18	100	8,641,600	10	.....	
Westinghouse Electric	160½	161½	+ 1	June 27	50	20,996,350	20	10 Q.	Jan., 1906
Westinghouse Air Brake	155	155	.....	Oct. 2	50	10,990,450		20 Q.	Jan., 1906

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Warren Mfg. Co., chartered in Massachusetts with a capital stock of $30,000, will manufacture vehicles and engines. The officers are: President, C. S. Ballard; treasurer, W. E. Merry Jr.; clerk, H. A. Buzzell, all of Springfield, Mass.

The United States Iron Co., Minneapolis, Minn., has been incorporated with a capital stock of $100,000. The directors are: Bernard W. Harris, president; Lee B. Harris, vice president; Carl T. Houston, secretary and treasurer.

The Refiners' Iron & Steel Co., Pittsburg, Pa., has been incorporated with a capital stock of $10,000. The directors are: Joseph C. DeNoon, Pittsburg; Isaac N. DeNoon, Haysville, and Henry F. Gilg, Allegheny.

The Terry Steam Turbine Co., Hartford, Conn., has been incorporated with a capital stock of $50,000 to manufacture and deal in steam turbines, machinery and tools. The incorporators are: Edward C. Terry, Louis C. Grover and J. S. Hunter.

The Capital Construction Co., Columbus, O., has been incorporated with a capital stock of $25,000 to manufacture and deal in structural iron, steel, etc. The incorporators are: Hugh Hugan, A. R. Stewart, A. J. Fox, H. L. Robinson and B. G. Watson.

The Machine Sales Co., New York, has been incorporated with a capital stock of $50,000 to manufacture engines, boilers, tools and machinery. The incorporators are: William H. Maclay, No. 13 West Thirty-first street, New York; J. Stanley Brown, Cold Springs, L. I., and John T. Ijams, No. 380 Lexington avenue, New York.

The New Jersey Furnace Co., corner Fourteenth and Washington streets, Hoboken, N. J., has been incorporated with a capital stock of $100,000 to manufacture furnaces, steam boilers, etc. The incorporators are: Henry Neiderlitz, No. 204 Narhowher street, West Hoboken; Edward D. Vanderbilt, East Orange, N. J., and Frederick Schill, No. 825 Hudson street, Hoboken, N. J.

The Porter-Whidden Co., incorporated with a capital stock of $30,000, will deal in machinery, etc. The officers are: President, E. C. Whidden, Brookline, Mass.; treasurer, G. M. Porter, Boston; clerk, F. C. Pate, Winthrop, Mass.

The Metal Core-Vent Mfg. Co., Buffalo, N. Y., incorporated with a capital stock of $115,000, will manufacture core-vents. The incorporators are: Arthur B. Underhill, Lorenz P. and John L. Chittenden and Clifford P. Coyle, all of Buffalo, and Henry C. Caldwell, of Philadelphia, Pa.

The Tudor Mfg. Co., has been incorporated in Massachusetts with a capital stock of $500,000 to deal in machinery and tools. The officers are: President, C. C. Marvel, West Medford, Mass.; treasurer, E. B. Page, Boston, and clerk, C. C. Marvel, West Medford, Mass.

The Connecticut Steel & Wire Co., Hartford, Conn., has been incorporated with a capital stock of $50,000. The incorporators are: Henry Green, Clarence W. Ferguson and Harrison B. Freeman Jr.

The Standard Foundry Co., Worcester, Mass., has been incorporated with a capital stock of $10,000. The officers are: Frank S. Williams, president, and Thomas F. Booth, treasurer.

The Casey & Hedges Co., Chattanooga, Tenn., has been reorganized with a capital stock of $900,000 to manufacture steam boilers, engines, etc. The incorporators are: Alfred Hill, Drauser Wulsin, Frank O. Suire, Clarence Pumphrey and Philip Hinkle.

The Ashtabula Foundry Co., Ashtabula, O., has been incorporated with a capital stock of $100,000. The incorporators are: John F. Mills, Thos. Fitzgerald, E. P. Hall, Fred E. Crosley and Julius F. Munsell.

The Ricketts Engineering Co., 621 Thirteenth street, N. W., Washington, D. C., has been incorporated for $15,000 by M. C. and Charles M. Ricketts and George C. Shinn.

The Thomas Somerville Co., 316-322 Thirteenth street, N. W., Washington, D. C., has been incorporated for $80,000 to conduct an iron and brass foundry.

The Bowman Foundry & Machine Co., Philadelphia, has been incorporated in Delaware to purchase and acquire lands for the erection of machine foundries. The capital stock is $100,000.

The Trojan Brake-Shoe & Foundry Co., Troy, N. Y., incorporated with a capital stock of $50,000, will manufacture brake-shoes, etc. The incorporators are: James H. Caldwell No. 55 First street; Thomas H. Campion, No. 223 Eighth street; Cornelius F. Burns, No. 10 Fourth street; Thomas S. Fagan, No. 627 Grand street; Richard Kellogg, No. 62 Second street, all of Troy, N. Y.

The Pedersen Mfg. Co., New York, chartered with a capital stock of $50,000, will manufacture machinery and devices. The incorporators are: Lorillard Spencer, Newport, R. I.; George W. Phillips, No. 34 Pine street, New York; Lorillard Spencer Jr., Newport, R. I.

The Princeton Mfg. Co., Brooklyn, N. Y., has been incorporated with a capital stock of $15,000 to manufacture and deal in iron, steel, copper and brass. The incorporators are: George V. Mulligan, No. 26 Patchen avenue; Harry Gates, No. 493 Madison avenue, both of Brooklyn, and James F. Bissell, No. 503 West 147th street, New York.

The Oldenbusch Metal Spinning Machine Co., Ossining, N. Y., has been chartered with a capitalization of $100,000 to manufacture machines, machinery, tools, etc. The incorporators are: Ernest Oldenbusch, No. 158 Park Side avenue; Nelson H. Stewart, No. 94 Seventh avenue, both of Brooklyn, and William W. Shaw, No. 15 Wall street, New York.

The Hercules Chain Co., Lebanon, Pa., is soon to be incorporated by C. M. Bowman, Isaac W. Weaver and Samuel E. Light, who will operate the newly erected chain mill in that city.

The Olcott Coal & Iron Co., has been incorporated with $500,000 capitalization by S. B. Avis, I. C. Jordan, Walter C. Hardy and others of Charleston, W. Va.

The Liberty Coal & Coke Co., Moundsville, W. Va., has been incorporated for $150,000 by J. D. Garard, D. C. Cumpston, George E. Rice and others.

The Union Hoe Co., with a capital of $50,000, has been incorporated at Atlanta, Ga., by James S. Lester, W. W. Draper and others of that city.

The Kalisch Air Brake Co., St. Louis, Mo., has been incorporated with a capital stock of $25,000 by Frederick Kalisch, W. P. Cushman, James Hardie all of that city, and Robert Glendenning of Chicago.

J. R. Sampson, of Middesboro, Ky., is president of the company which has been organized with $50,000 to develop coal lands in Lee county, Va. Coke will also be manufactured.

The Reynolds Car Brake Co., Peoria, Ill., has been incorporated by Andrew O'Neil, A. E. Reynolds and S. D. Wead for the manufacture of a mechanically applied friction brake for use on electric cars. The captal stock is $50,000.

New Construction:—

The Standard Roller Bearing Co., Philadelphia, Pa., has increased its capital stock from $2,000,000 to $3,500,000. This increase has been required to provide for the enlargement of the factory and equipment. A four-story building 150 x 200 feet will be erected at once for the manufacture of annular ball bearings on which this company holds basic patents. During the past year the Standard Roller Bearing Co. has equipped a four-story building 95 x 200 feet, and has built and equipped an iron foundry 70 x 150 feet, two stories in height, a hardening and tempering building 70 x 150 feet and a crucible steel

castings plant 60 x 100 feet. When the new building is completed the company will employ over 1,000 men. S. S. Eveland is general manager.

The bureau of yards and docks of the U. S. navy department has advertised for bids for the construction of a central power station at the New York navy yard. The estimated cost is $139,000. According to the plans the power for the various departments will all be generated in one central station.

The J. A. & P. E. Dutcher Co., Milwaukee, Wis., has let a contract for a 12-ton open-hearth steel furnace to the Meredith Bros. Co. This will increase the capacity of its present plant about 50 per cent and will necessitate considerable new building.

The Union Gas Engine Co., San Francisco, Cal., is erecting three new buildings on the site recently purchased in East Oakland. One will be used as a machine shop, another for testing engines and a third for storage purposes. The machine shop will be 130 x 300 feet with a 15-ton electric traveling crane and other modern equipment.

The American Steel Foundries is preparing plans for extensive additions to the foundry department of the plant at Granite City, Ill. The machine shop will be moved to other quarters, the car shop will be lengthened by 200 feet and additions will be made to the departments for chipping and finishing castings. Other improvements will raise the total cost of building now contemplated to about $200,000.

The Southern Car & Foundry Co. has under construction at Beaumont, Tex., a warehouse 27 x 106 feet to contain the blacksmith and pattern shops. The machine shop of the company is also being enlarged. Wm. Rentfrow is in charge of the improvements.

C. E. Farnsworth, president of the Union Machinery & Supply Co., Seattle, Wash., is having plans prepared for improvements aggregating $100,000 in connection with the Challoner-Perkins plant which he recently purchased. Mr. Farnsworth contemplates one of the largest machinery manufacturing concerns in the northwest. The Seattle plant will be started with a force of 150 mechanics.

The Nordberg Mfg. Co., Milwaukee, Wis., is to erect an addition to its machine shop 80 x 300 feet high and add considerably to the area of the pattern shop. These buildings will be of brick, steel and concrete. They will involve an expenditure of about $65,000.

The additions recently made to the plant of the Belle City Malleable Iron Works, Racine, Wis., are now completed. They include a new foundry building 76 x 200 feet, with an addition to the annealing room 80 x 100 feet. The core, trimming, tumbling and shipping departments have been increased in like proportion, with the result that the company's output is now at the rate of 10,000 tons annually as against 4,000 to 5,000 previously. The plant is working to its full capacity with its entire tonnage booked for eight months ahead.

The additions recently made at the plant of the Sibley Machine Tool Co., South Bend, Ind., have increased the floor space of the foundry about 8,000 square feet, and the machine shop 4,000 square feet. Seventy-five additional men will be employed. Equipment has been purchased.

For the new boiler shop which the Frick Co., Waynesboro, Pa., will erect this spring, two electric traveling cranes, one of 15 tons capacity and the other 5 tons will be required. Other equipment needed will be transferred from the old boiler shop.

The new building which the Commonwealth Steel Co. is to erect at Granite City, Ill., will be equipped with one Whiting Foundry & Equipment 10-ton electric traveling crane, a heavy service planer and two drill presses, contracts for which have all been let. The addition is made to care for the heavy tonnage of orders now booked which at the present time surpasses anything in the history of the company.

The Waterbury Metal Co., Waterbury, Conn., which has just been organized, has secured a 12-acre site in that city and will erect three large buildings, one of them a casting shop 50 x 100 feet, containing 20 furnaces.

The Big Four railroad has begun work on the new shops which it is erecting at Mt. Carmel, Ill. These shops will include a round house, wood working shop, machine shop and other buildings aggregating $250,000 in cost which will double the capacity of the present shops.

The new plant of the Toledo-Massillon Bridge Co., near Vulcan, Toledo, O., is nearing completion. It includes four large buildings, the main structure 109 x 405 feet, a machine and blacksmith shop 50 x 250 feet, an engine and boiler room and a template shop. Operations will be begun about May 1.

Plans have been prepared for the enlargement of the foundry of the Aurora Iron Works, Aurora, Ill., by the erection of a pattern shop, store house and other buildings.

Architect Mills, of Toledo, O., is drawing plans for the new steam shovel plant of the Vulcan Iron Works in that city. It is understood that work will be begun in the fall and that the cost of the new plant will be about $250,000. Eight buildings will be erected.

Reed & Prentice, Worcester, Mass., have awarded contracts to the G. H. Cutting Co. for two new buildings at their plants on Duncan avenue; one is a brick structure 65 x 207 feet, four stories high to be used for manufacturing purposes, and the other is a small cleaning house.

Work has been begun on the plant of the new Phoenix Foundry & Machine Works, Springfield, Mo., which when completed will cost about $50,000. The machine shop will be 50 x 70 feet, and the plant will include three other buildings of about the same size. The present plant will be moved to the new location as soon as the construction is completed. George H. McCann is president.

The car wheel foundry of the Chicago, Milwaukee & St. Paul railway at West Milwaukee, is to be enlarged with the idea of increasing the capacity from 185 wheels daily, as at present, to 400 wheels per day. This will involve the construction of several new buildings. New and enlarged car and locomotive shops are also planned by the company, but their location is as yet in doubt.

The Seneca Wire & Mfg. Co., Fostoria, O., has completed its factory building 265 feet in length, and machinery is being installed.

The Potthoff & Frey Iron Works, Cincinnati, has prepared plans for a two-story plant 102 x 175 feet of steel construction. The new plant will be erected at Front and Harriet streets, and will have about three times the capacity of the present quarters.

The King Machine Tool Co., Cincinnati, is adding an erecting shop 65 by 115 feet to its present plant.

The White Foundry & Machine Co., Anniston, Ala., is erecting a small foundry which will be added to later.

The D. E. Williams Valve Co., Cincinnati, has purchased a site upon which a plant estimated to cost $150,000 will be erected. Although the Williams company has been in existence but one year, its business has increased so rapidly that present quarters are inadequate.

S. B. Sexton Stove & Mfg. Co., Baltimore, is preparing plans for a three-story structure 150 x 150 feet to be added to its foundry and plant on West Conway street.

Fires:—

The Carpenter Steel Works, Reading, Pa., sustained a small loss by fire in the store house March 2.

The plant of the Wright Iron Range Co., St. Louis, Mo., was destroyed by fire March 6, the damage being estimated at $60,000.

The Toledo Metal Sign Co., Toledo, O., sustained a loss in its plant by fire March 1, the damage being placed at $25,000.

The core room and lower foundry of the United States Radiator Works, Dunkirk, N. Y., were destroyed by fire March 5, the loss being estimated at $150,000.

The St. Joseph Pump & Mfg. Co.,

St. Joseph, Mo., sustained a loss of $2,000 by fire at its plant March 4.

General Industrial Notes:—

The Mount Hope Iron Works, Somerset, Mass., which closed down about two years ago, has been purchased by interests which will shortly be incorporated under the name of the Somerset Iron & Steel Works. James Plant, of Syracuse, N. Y., will be president and treasurer; Wm. Meeker, of New Haven, manager, and Chas. Meeker, of that place, superintendent. Operations will begin at once toward putting the plant in shape for running and about 50 men will be employed in rolling bar iron. It is the intention later to manufacture nuts, bolts and make small castings.

Tuohy Bros., Nos. 114-118 Liberty street, New York, dealers in machine tools and traveling cranes, will on April 1 remove to No. 136 Liberty street, the same city.

The Bachman Foundry & Machine Co., Austin, Tex., has changed its name and officers. J. A. Bachman was for many years the head, but recently officers have been elected as follows: A. C. Goeth, president; Chas. Gardner, vice president; A. Giesen, treasurer, and Eugene Tips, secretary.

The rail straightening plant of the Block-Pollack Iron Co., Fort Worth, Tex., has been placed in operation with over 4,000 tons of steel rails on hand to be worked.

The Boyne City Charcoal Iron Co., Boyne City, Mich., is running on an average cast of 80 tons a day, and during its first year's operation had an output of about 25,000 tons. The fuel is obtained from the Boyne City Chemical Co., which furnishes most of the 6,000 bushels of charcoal required daily. Noah W. Gray, of Marquette, Mich., is secretary and treasurer of the company and Fred Smith is manager of the furnace.

The United States Brake Shoe Co., which was incorporated with a capitalization of $500,000, it is announced, will locate an extensive plant at Green Island, near Troy, N. Y. The officers of the company are: Thomas H. Campion, of Troy, president; Chas. Neilson, of Baltimore, vice president; Henry B. Corey, of New York, treasurer, and R. R. Marchant, of Baltimore, secretary. The patent brake shoe for the railway cars, invented by L. E. Robinson, a director of the company, will be manufactured. The plant will be established in the old plant of the Security Steel & Iron Co., on Green Island.

The Musconetcong furnace, Stanhope, N. J., expects to blow in within a fortnight. The Andover furnace, Phillipsburg, N. J., will go into blast about April 1. Another furnace is to be added at that place. The Gem furnace of the Allegheny Ore & Iron Co., Shenandoah, Va., is out of blast.

E. B. Gilmore & Co., Peoria, Ill., is to incorporate for the operation of the idle foundry of the John Hutchinson Foundry Co., Jackson, Mich., which it has leased.

The Taunton Steel Co., Taunton, Mass., recently organized under New Jersey laws, will manufacture drill rods from self hardening and carbon steel. The officers are: H. A. Williams, president, and E. A. Tetlow, treasurer, both of Taunton.

Love Bros., of Aurora, Ill., have acquired the old smelting plant in that city and will utilize it for foundry purposes. Plans are being prepared for the rebuilding of the plant, which will be operated on a large scale. The property includes a site of 20 acres.

The Bessie Ferro-Silicon Co., Columbus, O., made a remarkable record for rapidity in relining. When its furnace at New Straitsville, O., was blown out Feb. 13, the brick lining gave evidence of weakness. Considerable of the furnace load had to be shoveled out and all materials for relining had to be secured. No time was lost, however, and the work of repairs was actively begun Feb. 15. One week later the entire new wall was in place and in one week more the blast was started.

The Adrian Pulley Co., Adrian, Mich., recently capitalized for $25,000, will take over the Eames Pulley Co., Three Rivers, Mich. Vernon Hoxie is president and W. L. Dunbar, treasurer and manager.

The old officers and directors of Witherbee, Sherman & Co., Inc., 71 Broadway, New York, were re-elected for the ensuing year at the recent annual meeting. The officers are: President, F. S. Witherbee; vice president, E. A. S. Clark; treasurer, W. C. Witherbee, and secretary, L. W. Francis. These, with W. T. Foote and Moses Taylor, comprise the directory board. The shipments of ore from Port Henry during the past year were 622,227 tons, the largest since the opening of the mines about 60 years ago. Plans for still further enlarging the output are under way.

The controlling interest of the I. & E. Greenwood Co., Cincinnati, has been purchased by a syndicate composed of Henry Burkhold, Philip Fosdick and Claud Ashbrook. The company will be reorganized and the capital stock increased to $500,000, of which $300,000 will be common stock. Philip Fosdick, who recently retired from the management of the Fosdick Machine Tool Co. will be active in the management of the Greenwald Co., which manufactures engines and boilers.

The Connecticut Cord Iron Corporation at its annual meeting recently held at Norwich, Conn., declared a dividend of 10 per cent, and elected Wm. B. Ring president, and Hezekiah Perkins secretary and treasurer.

An interest in the Capitol Lock-Nut & Washer Co., Columbus, O., has been taken over by local business men. The company is organized under Colorado laws with T. H. Ryan, president, and A. M. Gaines, vice president and general manager. It will manufacture a patent lock-nut for bolts in addition to ordinary nut washers and bolts. A building 80 x 200 feet is being erected, machinery has been ordered, and operations will begin about May 1. A reorganization plan has been decided on, incorporating the company for $1,250,000 under New Jersey laws, of which only $750,000 will be issued, the remainder being held in the treasury.

The Kilbourne & Jacobs Mfg. Co., Columbus, O., at a special meeting of the stockholders held recently, increased the common stock of the company to $1,325,000, which with the outstanding issue of preferred stock, makes the total capitalization $2,000,000. This will be issued to present stockholders, a stock dividend of 100 per cent providing for this. The common stock has been paying quarterly dividends of 2½ per cent. The company was organized over 20 years ago as the Revolving Scraper Works, the present name being adopted in 1887 when the present site was occupied.

The Standard Trust Co., of New York, has purchased the plant of the National Electric Co., Milwaukee, which has been in bankruptcy court for about a year.

The Automatic Refrigerating Co., 22 Thames street, New York, which represents the merged interests of the Automatic Refrigerator Co., Cleveland; the Singer Automatic Ice Co., Bridgeport, and the Marshall Ice & Refrigerating Machine Co., Boston, is to remove its offices, shop and refrigerating show plant to Hartford, Conn., where greatly increased manufacturing facilities will be provided. The company makes a specialty of small equipment in the refrigerating line. F. E. Matthews is acting manager.

The United States Cast Iron, Pipe & Foundry Co. has been awarded the contract for a large quantity of cast iron pipe ranging from 8 to 20 inches for the high pressure service equipment, Cleveland. Special castings in this connection will be made by the American Car & Foundry Co., of Detroit. The two contracts involve about $67,000.

The Bessemer Machine & Foundry Co., Birmingham, Ala., has made two large bells for the No. 5 furnace of the Tennessee Coal, Iron & Railroad Co., at Ensley, the two castings weighing 26,400 pounds.